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ABSTRACT

A discussion of the economics of higher education begins with an outline of the history of higher education, and a profile of American postsecondary institutions in the recent past and the present. An analysis of the outlook for enrollments follows. Data are given on enrollment trends since 1951, according to sector (public versus private), institution type, and degree level and subject area. Demographic profiles illustrate a forecast of enrollment trends through 2,000. The geographic distributionof the traditional college-age population is outlined, and graduate and professional education populations are also discussed. Financial data on recent funding and funding trends in private and public institutions and on faculty illustrate a discussion of revenue and fiscal capacity, especially as they are affected by the federal government. It is concluded that increasingly intense competition for students will be important in higher education economics in the 1980s, and there will be continuing efforts to economize. The intellectual vitality of the faculty is seen as important to the health of higher education, though the demand for new, younger faculty members is foreseen to be very small in the near future. Appended are a list of references and suggestions for further reading. (MSE)

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I. INTRODUCTION

An appreciation of the economic context in which American higher education operates is central to any thorough examination of the complex interrelations between higher education and government. Both the concrete effects of governmental policy, as well as how that policy is perceived, are profoundly influenced by higher education's general financial condition.

The American higher educational enterprise has come upon hard times. To be sure, the hard times have not fallen evenhandedly on the entire sector, and indeed some of its elements are enjoying relative prosperity, but the general level of discomfort and worry are high. It is the main purpose of this paper to provide a broad overview of these conditions.

Between this brief introduction and the conclusion, the paper is divided into four major sections, two of which are, for convenience, further divided by subtitles. Section two traces some central themes in the history of American higher education, and the following section provides a largely statistical description of the highly diverse modern system. The fourth section focuses on the outlook for enrollment but also deals, at least briefly, with the subject of degrees, and the last major section is a discussion of some important aspects of educational finance.

The final brief section, "Concluding Observations," is principally a summary of themes and issues which seem likely to be most crucial in the years to come. An appendix mentions a few additional sources which a reader having a special interest in some of the topics treated in this paper might sometime wish to consult.

II. SOME HISTORICAL THEMES

Our primary concern is with America's institutions of higher education in the context of the rapid growth that was experienced during the 1960s, the deceleration of the 1970s, and the slow growth, or possibly even shrinkage, that many expect will be the dominant theme of the 1980s. However, at the outset it is worth observing that the single most striking characteristic of the system is the large number and variety of institutions that comprise it.[1] They vary greatly in style, purpose, size, location, heritage, governance -- to name but some of the important bases of comparison. The diversity has emerged over a long period. There is not now the opportunity to tell the full story in any detail, but a brief sketch of some major historical themes provides a useful prelude to a more detailed consideration of the present system and its relatively recent development.

An uncelebrated though intriguing episode in American history -- and a good starting point -- is the long-standing series of efforts to create a national university. When the idea originated is unclear. David Madsen mentions that William Douglas had written about it in the 1750s, and Samuel Blodgett, a young soldier, reports a conversation he had on the subject with George Washington while they were camped on the grounds of Harvard College in the fall of 1775.[2] The first formal proposal for a national institution that would emphasize graduate instruction and research came from Benjamin Rush in an article published in 1787. Rush's view was that education should aim at practical ends and at inspiring patriotism. Latin and Greek were prominent in the contemporary curriculum, but he had little use for these languages, holding instead that "the rejection of the ancient languages would further banish Latin and Greek words, such as *exit*, *fecit*, *excudit*, *acme*, *finis*, *bona fide*, *ipso facto*, and a hundred others, equally disgusting, from English composition."[3] He had himself experienced and admired training in Europe, but "an education in our own is to be preferred to an education in a foreign country."[4] Education at the federal university was to be for those who were already college graduates.

The concept of a national university came up explicitly at the Constitutional Convention. James Madison and Charles Pinckney endeavored to have the authority to create a university included as one of the powers of Congress. By a close margin, their efforts failed, but even though the concept was not mentioned in the Constitution, it attracted the interest and efforts of George Washington and the next five presidents.[5]

Acting as intermediaries, John Adams and Thomas Jefferson suggested to President Washington one dramatic step towards the establishment of a national university. The idea, proposed to Adams and Jefferson by a Swiss scientist, was to invite the entire faculty of the University of Geneva to come to the United States.

The political turmoil of the 1790s had intruded upon the work of that university so that such a proposal would possibly have appealed to the professors, and Jefferson estimated that the entire move could have been accomplished for $10,000.[6]

For a number of reasons, Washington declined to pursue the unusual idea, but he continued in his enthusiastic efforts to initiate a national university. In his last message to Congress, he gave what is not hard to view as a late eighteenth century analogue of the notions frequently expressed today on the virtues of geographical distribution in a student body. Washington's words were:

> Amongst the motives to such an institution [a national university], the assimilation of the principles, opinions, and manners of our countrymen by the common education of a portion of our youth from every quarter well deserves attention. The more homogeneous our citizens can be made in these particulars the greater will be our prospect of permanent union and a primary object of such a national institution should be the education of our youth in the science of government.[7]

Washington's support for the national university continued in an important way even after his own life had ended because he made a bequest of fifty shares of stock in the Potomac Company "towards the endowment of a UNIVERSITY to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it...."[8] At the time of his death, the gift was worth about $25,000, and in 1916 one

Congressman estimated that had Washington's wishes been carried out, an endowment of $24 million would then have been available. In fact, however, by 1823 the stock had lost all value, and Madsen reports that "there is no record of what happened to the fifty shares in question."[9]

Over the years others have contributed their efforts. The idea of a national university has had its lively and enthusiastic support, more in some periods than in others, but of course it has never finally come to fruition. How things would differ if a national university had been created is interesting to contemplate but impossible to know. In any event, with this sense of what might have been in mind, we come to trace the development that actually did occur.

Nine colonial colleges had been established before the American Revolution. With the dates when they were established and their modern names, they are: Harvard, 1636; William and Mary, 1693; Yale, 1701; Princeton 1746; Columbia, 1754; Pennsylvania, 1755; Brown, 1765; Rutgers, 1766; and Dartmouth,1769.[10] These colleges were tied quite explicitly to religious purposes, though in varying degrees; the connections were somewhat looser for Pennsylvania and Columbia than for the others. Indeed, Pennsylvania was formally non-sectarian though Richard Hofstadter has characterized it as having had, even so, "an Anglican tinge."[11]

Except possibly for Columbia and Pennsylvania, the training of ministers was a major part of the original purpose of these colleges. The founding of Harvard was an outgrowth of the early settlers' desire "to advance learning and perpetuate it to posterity; dreading to leave an illiterate ministry to the churches when our present ministers should lie in the dust."[12] President Thomas Clap of Yale left no doubt about his sentiments on the role of colleges when he said:

> Colleges are Religious Societies, of a Superior Nature to all others. For whereas Parishes are Societies, for training up the common People; Colleges are Societies of Ministers, for training up Persons for the Work of the Ministry.[13]

Despite President Clap's hopes, the revolutionary era challenged some of the established ways, and not surprisingly, the new themes had their impact on the colleges. Tewksbury quotes several reminiscences. In one, Bishop W. Meade described events in Virginia:

> Infidelity was rife in the State, and the College of William and Mary was regarded as the hot bed of French politics and religion. I can truly say that then and for some years after in every educated young man in Virginia whom I met I expected to find a sceptic, if not an avowed unbeliever.[14]

Another, from Reverend Lyman Beecher, suggests that, at Yale too, the students were hardly immune to the temper of the time:

> Yale College was in a most ungodly state. The College church was almost extinct. Most of the students were skeptical and rowdies

> were plenty. Wine and liquors were kept in many rooms; intemperance, profanity, gambling, and licentiousness were common. . . . Most of the class before me were infidel, and called each other Voltaire, Rousseau, D'Alembert, etc.[15]

During and after the Revolution there was, predictably, conflict over the control of the institutions. Who was to govern them? What were to be the procedures for designating membership on governing boards? For Brown, Princeton, and Rutgers the problems were relatively few, but the six other colonial colleges found themselves in substantial controversy with the state over basic matters of governance.[16] What is remarkable is that all nine colleges survived the Revolution intact, and although certain changes had been made, none had come under the direct supervision of a state.[17] It is also worth noting that what battles there were tended to be carried on before legislatures rather than before courts.

The high point of the conflict over the definition and rights of a private college did come in the courts in the Dartmouth College case which was finally decided in 1819. Most basically at issue was whether Dartmouth was public or private. The legislature of New Hampshire had changed the institution's name to Dartmouth University and had taken steps to control it. The trustees of Dartmouth College went to court in New Hampshire to regain their authority, but the court found against them. In 1818 the case came before the Supreme Court. An alumnus of its class of 1801 argued the case for Dartmouth College and summed up as follows:

> This, sir, is my case. It is the case, not merely of that humble institution, it is the case of every college in the land. It is more. It is the case of every eleemosynary institution throughout our country. . . the case of every man who has property of which he may be stripped-- for the question is simply this: Shall our state legislature be allowed to take that which is not their own, to turn it from its original use, and apply it to such ends or purposes as they, in their discretion shall see fit? Sir, you may destroy this little institution . . . , but if you do . . . you must extinguish, one after another, all those great lights of science, which, for more than a century, have thrown their radiance over the land! It is, sir, as I have said, a small college, and yet there are those that love it. . . .[18]

No doubt his eloquence was a factor, but presumably there were deeper reasons, too, why Daniel Webster won his case. The main finding of Chief Justice John Marshall's court was that Dartmouth's charter was a contract which the legislature of New Hampshire had violated. The decision was an encouragement to those who would found private colleges and a message to states that expropriation of private colleges was not a way to obtain state universities.[19]

By the time of the Civil War there were 182 colleges which Tewksbury characterizes as "permanent." Roughly 160 were denominational, and many of them had been founded after the Dartmouth College case at a time when the expanding frontier was creating demand for new colleges. Indeed, fourteen denominational colleges existed in Ohio alone. On the other hand, of the total of 182, twenty-one were state universities. The history of each is different, but broadly speaking, the ideals that came with the Revolution created a demand for some institutions of higher education that were controlled by the state. Table 1 shows where the first twenty-one state universities were located and when each obtained a charter authorizing it to confer degrees.[20] Significantly,none had been founded in a state where one of the nine colonial colleges existed. In the six original states listed in Table 1 -- located in the South except for Delaware -- the state universities began without grants of land from Congress whereas in the fourteen new states listed in the table -- located in the West except for Alabama -- there generally was such a grant of land as a basis for getting started. A precedent for the federal government to subsidize public education by granting land to start state universities was, in this way, established.

TABLE 1*

States Having State Universities Before the Civil War
and the Dates When the Charters Were Issued

Six Original States		Fourteen New States			
Georgia	1785	Vermont	1791	Missouri	1839
North Carolina	1789	Tennessee	1794	Mississippi	1844
South Carolina	1805	Ohio**	1802,1809	Iowa	1847
Maryland	1812	Alabama	1821	Wisconsin	1848
Virginia	1816	Indiana	1828	Minnesota	1851
Delaware	1833	Kentucky	1837	Louisiana	1853
		Michigan	1837	California	1855

*Tewksbury, The Founding of American Colleges..., p. 170.

**Ohio had two state universities. Ohio University obtained its charter in 1802. Miami University's was granted in 1809.

An important theme which runs parallel with the development of institutions is the vocational content of these institutions' offerings. For Thomas Clap the purpose of a college was to train ministers, and for many colleges, especially in their early years, overwhelmingly their graduates did become ministers. However, in time there typically came some diversification. The pattern at Harvard is instructive. In the 1640's, roughly 70 percent of the graduates became clergymen, but a century later it was about 45 percent, and a century later still, it was under 10 percent.[21] Two forces were at work to produce such a change. First, the range of occupations regarded as suitable endeavors for a college graduate had simply expanded. In addition, the content of theological education had gradually been increasing in scope, and more and more of it came to be done in separate theological seminaries and, within the older institutions, in separate schools of theology.[22]

Medical and legal education, to an important extent, moved in the other direction. Over time, such training was done less in apprenticeship and more within the setting of an educational institution. Sometimes the educational institution was a university, and sometimes it was a separate entity. A famous school of this latter type was the Litchfield Law School in Connecticut. Opened in 1784 by Tapping Reeve, it survived until 1833; among its students were John C. Calhoun, Aaron Burr, and Horace Mann. Gradually, medical and legal training came to be provided more within the universities, but as late as 1910 only five of the 124 law schools then in existence required as much as three years of college training for admission.

The development of scientific and technical training began in earnest in the first half of the nineteenth century. An especially important early contributor was the United States Military Academy which had its beginning in 1802 when Congress established that a "Corps of Engineers" should be stationed at West Point in New York.[23] Not everyone thrived there. The artist James McNeill Whistler was one who did not, and his rather succinct observation about his relationship to the academy was: "Had silicon been a gas, I would have been a major general."[24] But while Whistler did not thrive, science did. The Academy set high standards in mathematics and the physical sciences, and many of the early professors of mathematics in American colleges were graduates of West Point. Indeed, writing in 1850, President Francis Wayland of Brown was led to observe:

> West Point, graduating annually a smaller number than many of our colleges, has done more towards the construction of railroads than all our one hundred and twenty colleges united.[25]

The generosity of Stephen Van Rensselaer led to the founding, in 1824, of Rensselaer Polytechnic Institute which followed West Point's example and itself became preeminent. Later in the nineteenth century, its eminence would be shared with others, but according to Frederick Rudolph it was, before the Civil War, "the center of applied science in the United States."[26] Van Rensselaer stated that his aim was to train teachers who could go into the schools and teach

> the sons and daughters of farmers and mechanics . . . in the application of experimental chemistry, philosophy, and natural history, to agriculture, domestic economy, the arts, and manufacture.[27]

This philosophy was an explicit forerunner of the land-grant movement.

Scientific inquiry began in other places, too, sometimes in institutions created principally for that purpose -- like Polytechnic Institute of Brooklyn, founded in 1854, and Massachusetts Institute of Technology which began in 1861 -- and sometimes in new divisions within the older institutions. Around mid-century, for example, Yale's Sheffield Scientific School and Harvard's Lawrence Scientific School began. At both Yale and Harvard there were some differences between the new programs in science and the more traditional course of undergraduate study. Standards for admission were lower in science, and the new program lasted for three years, not four. More generally, the science students were looked down upon; the Sheffield students even had to sit separately from the "regular" students in chapel. The ultimate formal statement of the difference came with the creation of separate degrees for the students of science. Harvard awarded its first Bachelor of Science degree in 1851, and Yale gave its first Bachelor of Philosophy in 1852. Work in science was not to be allowed to dilute the premier undergraduate degree, the Bachelor of Arts.[28]

The training of teachers provided another important aspect of the vocational content of American higher education. Throughout much of America's history, this training has been largely a hit-or-miss affair. Especially in the early part of the nineteenth century, the notion was widespread that a teacher for the local school required little training. When coupled with localities' efforts to keep down the cost of the school -- most of which was the teacher's salary -- as well as the rather ready availability of people to serve as teachers -- frequently but not always women -- this notion was reinforced. Often enough, teaching was a temporary activity, not a full-fledged, full-time profession; many taught as a stop-gap until something better came along. Often enough the job was not so much teaching as schoolkeeping.[29] This general atmosphere contributed to the modest level of training of many teachers. Indeed even in the beginning of the 1930s, over one-quarter of the nation's elementary school teachers had had less than two years of formal education beyond high school, roughly forty percent of the junior high school teachers had not completed college, and the situation for high school teachers was hardly much better.[30]

Although the educational background of America's teachers has never been all that one might reasonably have wanted, for roughly a century and a half there have been forces of some consequence at work to improve it. An important early influence came from Europe. In France and Prussia the training of teachers was taken seriously. People like Horace Mann and Henry Barnard traveled abroad, observed, and brought ideas across the Atlantic.[31]

The normal school became an important institution providing training for teachers. The first private one was started at Concord, Vermont in 1823, and the first public one, in Lexington, Massachusetts in 1839.[32] A normal school was not a college; around 1860 most students entered with essentially an elementary school education. The typical course lasted one or two years, but the majority of the students stayed for only a portion of it. Over time the number of normal schools grew -- there were ninety-two public normal schools in 1890 -- and standards tended to rise. In 1890 the New York State Normal College at Albany required, for the first time, that entrants be high school graduates. Over time, too, some of the normal schools were themselves promoted to the status of teachers' colleges with authority to grant the bachelor's degree. The first promotion of this sort came in 1903 when the Michigan State Normal College at Ypsilanti was authorized to grant the Bachelor of Arts in Education.[33] This pattern of transformation became widespread; by 1935 there were 158 teachers' colleges, 148 of them being public.

Along with the development of the normal school and teachers college came the development within the older institutions of higher education themselves of chairs and departments of education. Although there was instruction in education in some of those institutions as early as the 1830s, the first permanent chair in a university was apparently established at the University of Iowa in 1873; by 1907 that university had a school of education.

In 1890 there were just a few chairs in education throughout the nation, but by the turn of the century there were over 250. Moreover, by 1900 over one-quarter of the liberal arts colleges offered courses in education.[34] After 1900 there was a rapid growth of schools or departments of education in state universities.

An additional important thread in this history concerns the land-grant college movement. The Morrill-Wade Act of 1862 made provision for each state to receive 30,000 acres of public land, or equivalent land script, for each of its senators and representatives based on the distribution of population in 1860. As a consequence the states received the proceeds from the sale of 17.4 million acres of public land, and this money was to go to support in each state at least one college "where the leading object shall be, without excluding other scientific or classical studies, to teach such branches of learning as are related to agriculture and the mechanic arts."[35] Typically the college or colleges in each state designated as the beneficiaries of this legislation came to be called "A and M" -- for agricultural and mechanical -- colleges, but the precise pattern of designating colleges was not the same in all states. In some, new colleges were established; elsewhere existing agricultural colleges were given the "A and M" designation; and there were other patterns, too.[36] Today there are roughly seventy land-grant colleges, all of them exclusively public except for Cornell and MIT.[37]

The "A and M" colleges had basically two missions, and one was simpler to accomplish than the other. As engineering schools they developed relatively straightforwardly, and by 1927 they were educating roughly half of the nation's engineers. But they were intended to provide agricultural education, as well, and in this capacity, their early development was more complicated. The farmers were resistant. An agricultural paper in Philadelphia wrote:

> Instead of introducing the student of agriculture to a laboratory and chemical and philosophical apparatus, we would introduce him to a pair of heavy neat's leather boots and corduroy pants, and learn him how to load manure.[38]

The situation did not improve when farmers' children who attended A and M schools used them, as they sometimes did, not to master the intricacies of scientific farming but as a means of escaping to a different kind of life. Ultimately, farmers did develop allegiance to these institutions because they learned, very simply, that scientific farming could enhance their income and living standards.[39]

A good summary of the significance of the land-grant college is Frederick Rudolph's statement:

> In the end, the land-grant college incorporated in its rationale the Jacksonian temper; it became the common school on a higher level; it became one of the great forces of economic and social mobility in American society; it brought the government, both federal and state, firmly into the support of higher education. In the land-grant institutions the American people acheived popular higher education for the first time.[40]

During the several decades following the Civil War the American university took on, quite recognizably, its modern form.

Late in the nineteenth century Professor Basil Gildersleeve of Johns Hopkins recalled how, in an earlier time, he had had to travel to Germany for his own training because it had been impossible to obtain in America.[41] By the time Professor Gildersleeve made these remarks -- in 1893 -- conditions had changed dramatically, and most would-be American scholars then had ample opportunity to obtain training without going abroad.

The events leading to the emergence of the American university were many; only the barest mention of a few of them can be offered here. In 1861 Yale awarded three doctorates, the first American Ph.D.s.[42] Cornell, partially public by virtue of its land-grant status and partially private, had brought together successfully on one campus the new vocationalism of the land-grant movement with the expanding interest in academic scholarship. Johns Hopkins had opened in 1876, under the leadership of Daniel Coit Gilman, almost exclusively devoted to research and graduate education, and Clark University had begun in 1889 with G. Stanley Hall as its president, devoted exclusively to these purposes.[43] Rudolph gives us one clue to the developing character of the American university when he writes of Johns Hopkins' development as a "faculty-centered" institution.[44]

Following the Civil War the state universities in the South lost the preeminent role in the state university movement which, to an important extent, they had won in the first half of the nineteenth century. The momentum in the movement shifted to the Midwest and West, to institutions like the University of Michigan, the University of Minnesota, and the University of Wisconsin among others.[45] Possibly the success of the public universities appeared threatening to some in the private sector because, before long, some conflict emerged. In a speech before the National Education Association in 1873, President Charles Eliot of Harvard attacked the concept of public education in the following way:

> There is a skepticism of the masses in Massachusetts as to the justice of everybody paying for the advanced education of somebody's child. The mechanic, the blacksmith, the weaver says, 'Why should I pay for the professional education of the lawyer's son, the minister's son? The community does not provide _my_ son his forge or loom.'[46]

President James B. Angell of the University of Michigan willingly joined the debate as the spokesman for the public universities. The modern phase of the rivalry between the public and private sectors was certainly under way.

In the period following the Civil War the American industrial economy took on its modern complexion. Great fortunes emerged and, in some instances, became instrumental in the founding of private universities. To name only a few, Johns Hopkins, Clark, Vanderbilt, Duke, Stanford, and Rice all had their beginnings in this way.[47] Cornell had a two-sided bounty, what it received under the terms of the Morrill-Wade Act as well as a generous gift from Ezra Cornell. And in the founding of the University of Chicago, the role of private giving was as central as it had been anywhere. A friendly rivalry developed between some wealthy citizens of Chicago and an outsider named John D. Rockefeller. Although those from

Chicago gave generously, they came nowhere near matching the $35 million that, by 1916, Rockefeller had provided. The venture had obviously caught his imagination -- to say the least. Indeed even by 1906 he had decided, "It is the best investment I ever made in my life."[48]

Two final themes to bear in mind concern the education of particular groups, women, Negroes, and various denominations. One is that there has been a growing tendency for the typical student body to become increasingly heterogenous, to accept members of groups which were formerly excluded. But the other theme is that many American colleges were founded and still exist to serve women, or Negroes, or members of a particular denomination. As it happens, today the Catholic institutions are, as a group, the most highly visible of all the denominational colleges.[49] What is most important is to be aware that in the history of American higher education both themes -- homogenization as well as segregation of particular groups -- have been in operation.

By the beginning of the twentieth century virtually all of the major themes which are with us today had been established. Even the two-year college movement -- about which nothing has been said so far but which was to become of such significance in the 1960s -- was under way.

Certainly by 1900 it was a fait accompli that the system was going to develop without one capstone institution to set standards and provide overall guidance if not supervision. Instead, the system emerged with enormous variety in standards, patterns, programs, and purposes. The parallel development of secular and religiously-oriented institutions was a fact. Another fact was the expanding arena of vocationalism in conjunction with the blurring of the distinction between training for a vocation and for a profession. Already the liberal arts college had been flanked on one side by the university. It was eventually to be flanked on the other side, too, by the two-year college, but that development lay still farther in the future. Special institutions were created for the education of particular people. In the beginning college was for white Protestant males. Eventually student bodies were to become more diverse, but particular institutions arose to serve particular groups. Finally, the emerging competition -- for both good and ill -- between the public and the private sectors was observable in the Revolutionary era, powerfully expressed in the Dartmouth College case, and had appeared in a recognizably modern format by the 1870s.

Two fundamental questions enmeshed in that latter issue are very much with us today. They will certainly occupy our attention in the remainder of this paper, and to state them is as good a note as any on which to conclude this brief survey of some important history: who should go to college? Who should pay for the support of higher education?

III. THE INSTITUTIONS: RECENT BACKGROUND AND CONTEMPORARY SETTING

This section furnishes some basic information about America's institutions of higher education essentially in the contemporary setting. In the academic year 1976-77 there were 3,075 institutions in what the National Commission on the Financing of Postsecondary Education has referred to as the collegiate sector of American postsecondary education, the sector on which our attention will be focused.[1,2]

The institutions in the collegiate sector may be described in numerous ways. A taxonomy which has come into wide use is the one presented by the Carnegie Commission on Higher Education in 1970 and usually referred to as the Carnegie classification.[3] This scheme provides a gross division of institutions into five categories and a finer division into eighteen categories. The scheme is presented in Table 2 with the one-digit and two-digit codes used by the Carnegie Commission; the table also contains the number of institutions and enrollments in the various categories for the fall of 1970.[4]

In a number of instances the titles of the various categories indicate rather well the major characteristics of the indicated institutions. Precise definitions are presented in the Carnegie Commission's A Classification of Institutions of Higher Education. For now a few words of explanation will serve to augment the information contained in the titles.

TABLE 2*

The Carnegie Classification
Number of Institutions and Enrollments, Fall 1970

	Major Classification, Subclassification, and Codes of Identification	Number of Institutions Fall, 1970	Enrollment or Approximate Enrollment Fall 1970 (in thousands)
1.	Doctoral-Granting Institutions	173	2,678
1.1	Research Universities I	52	1,100
1.2	Research Universities II	40	611
1.3	Doctoral-Granting Universities I	53	641
1.4	Doctoral-Granting Universities II	28	325
2.	Comprehensive Universities and Colleges	453	2,501
2.1	Comprehensive Universities and Colleges I	321	2,099
2.2	Comprehensive Universities and Colleges II	132	402
3.	Liberal Arts Colleges	719	686
3.1	Liberal Arts Colleges I	146	186
3.2	Liberal Arts Colleges II	573	500
4.	Two-Year Colleges and Institutes	1,061	2,348
5.	Professional Schools and Other Specialized Institutions	421	287
5.1	Theological Seminaries, Bible Colleges, and Other Institutions Offering Degrees in Religion	196	48
5.2	Medical Schools and Medical Centers	43	45
5.3	Other Separate Health Professional Schools	26	10
5.4	Schools of Engineering and Technology	32	56
5.5	Schools of Business and Management	28	45
5.6	Schools of Art, Music, and Design	50	27
5.7	Schools of Law	14	10
5.8	Teachers Colleges	9	12
5.9	Other Specialized Institutions	23	33
TOTALS		2,827	8,500

*The Carnegie Commission on Higher Education, A Classification of Institutions of Higher Education, pp. 1-7.

Doctoral-Granting Institutions were classified into one of the four subcategories on the basis of how many doctorates they awarded and how much money they received from the federal government for work in science. Research Universities I contained the highest, and Doctoral-Granting Universities II, the lowest ranking institutions on this index. Comprehensive Universities and Colleges offer a liberal arts program plus at least two programs -- for class I -- and at least one program -- for class II -- of a professional or vocational nature. The definition of a liberal arts college is fairly straightforward. Institutions in Liberal Arts Colleges I were more selective in admissions or had a larger proportion of alumni holding Ph.Ds from major universities than did institutions in Liberal Arts Colleges II. Two-Year Colleges and Institutes is a fairly clear designation, and, of course, there is typically a major distinction between the public and private institutions in this category. Professional Schools and Other Specialized Institutions were so classified if they were generally separate from larger institutions and self-contained. The subcategory Other Specialized Institutions includes graduate centers, maritime academies, military institutes without liberal arts programs, and a few institutions that simply could not be properly classified anywhere else.

Not only does the Carnegie classification help us to understand certain features of American higher education; it is also a taxonomy which tempts academics to thinks in terms of a hierarchy of institutions. Louis T. Benezet has put this point well:

> It would scarcely be diplomatic to refer to the list as a pecking order. In terms of students, patrons, neighbors, or area legislators, any one institution might be preferred to any other. In terms of the academic establishment, as led by the strongest graduate schools, the list is considered to be in precise pecking order.[5]

A little arithmetic applied to the data of Table 2 shows that the average size of the institutions--measured by enrollment--varied sharply among the major categories. Table 3 makes the point explicitly.

TABLE 3*

Average Enrollment in 1970 by
One-Digit Carnegie Category

1. Doctoral-Granting Institutions	15,479
2. Comprehensive Universities and Colleges	5,522
3. Liberal Arts Colleges	954
4. Two-Year Colleges and Institutes	2,213
5. Professional Schools and Other Specialized Institutions	681

*These numbers were derived from data in: The Carnegie Commission on Higher Education, A Classification of Institutions of Higher Education, pp. 6-7 .

The balance between the public and the private sectors in each category appears in Table 4. Overall, slightly more than half of all institutions were privately controlled, but roughly three-quarters of the enrollment was in the public sector. There was, of course, some category-by-category variation around these grand averages. For example, liberal arts colleges were almost exclusively private whereas two-year colleges were mostly public, more so if one concentrates on enrollment, less so if one considers institutions.

TABLE 4*

Proportions of Institutions and Enrollments
in the Public and Private Sectors, by One-Digit
Carnegie Classification, in 1970

Category	Institutions		Enrollments	
	Percent public	Percent private	Percent public	Percent private
1. Doctoral-Granting Institutions	62	38	75	25
2. Comprehensive Universities and Colleges	68	32	79	21
3. Liberal Arts Colleges	4	96	5	95
4. Two-Year Colleges and Institutues	76	24	94	6
5. Professional Schools and Other Specialized Institutions	15	85	37	63
All	46	54	74	26

*The Carnegie Commission on Higher Education, A Classification of Institutions of Higher Education, pp. 6-7.

Turning from our description for 1970 to a consideration of changes over time, we face problems in finding strictly comparable information; and none using the same scheme in the same level of detail is readily available.[6] It is, of course, well known that during the 1960s expansion was one of the central themes, and therefore how this expansion was accomplished is an important question. In particular, to what extent did new institutions emerge, and to what extent did existing institutions expand? For several reasons this question is a good deal easier to ask than to answer precisely. One of the problems is that an institution would frequently respond to the momentum of growth by adding new programs as well as by expanding existing ones with the result that, based upon its highest level of degree offered, it would be classified differently in a later than in an earlier year.[7] Thus, although there have been many genuine openings and some genuine closings of institutions, this phenomenon of reclassification has occurred frequently enough to make it somewhat difficult to interpret changes in the number of institutions classified by highest level of degree offered.

This process of institutional migration is explored in some detail by Harold L. Hodgkinson in Institutions in Transition: A Profile of Change in Higher Education.... He writes, "For the most part, there is a general pattern of moving up the ladder in terms of level of degree awarded. (I have called this 'higher education--the higher the better.')"[8] Later he puts it this way:

> With regard to level of degree, it is likely that there is operating in America a system of vertical mobility, that institutional change exists in a hierarchy based on the highest level of degree offered. As one would expect, the greatest amount of change occurs when programs change without being accompanied by corresponding changes in the highest level of degree offered. But when one looks at changes in degrees, it is clear that institutions move from less than B.A. to B.A., from there to M.A., and from there to Ph.D. This we can call "upward mobility," and it is clearly the conventional and most widely followed path. Relatively few institutions reverse this trend and offer a "lower" degree than previously offered and the consequences are often painful.[9]

Trends in the total number of institutions of higher learning tell an important part of the story of change. Between 1950 and 1975, the number of institutions increased by 1,196, an increase of nearly two-thirds; on the average, the increase was almost fifty institutions per year.[10] In the first part of the period, between 1950 and 1966, the number of public and private institutions grew at about the same rate. Toward the end, between 1966 and 1974, the rate of growth was much higher in the public sector; whereas 36 percent of all institutions were public in 1966, by 1976 the proportion was 48 percent. Of the overall increase of 1,196 institutions between 1950 and 1975, 816 were public and 380 were private. Thus, while there was clearly more growth in the public sector, there was also substantial growth in the private sector. This very important point is frequently overlooked.

A comparison of the number of institutions in 1950 and 1975 on the basis of the highest degree offered shows clearly the important role of the public two-year institution in the developments of the past few decades. Of the roughly 1,200 new institutions, just over half were public two-year colleges. By stark contrast, in the same period the number of private two-year colleges increased by only five. Thus, whereas 55 percent of all two-year colleges were public in 1950, by 1975 the figure was 79 percent. It is also of interest that there was actually a decrease over the period of fifty-six in the number of public institutions with their highest offering the bachelor's and/or first professional degree. This change no doubt reflects the phenomenon of institutional migration with augmentation of program leading to reclassification.

Not only did the number of institutions expand; on the average they grew in enrollment. Table 5 shows the figures and illustrates especially the difference between the public and private sectors. On the average, public institutions were always bigger than private ones, and during the period they expanded faster. The average private institution was roughly 60 percent larger in 1975 than in 1950; the average public one, 240 percent. In 1950, the average public institution was nearly twice as large as the average private institution, and by 1975, it was about four times as large. But once again, it is important to emphasize that, although the pace of expansion was faster in the public sector, there was expansion in the private sector as well.

Table 6 presents another perspective on the changing size of institutions. It is striking that in 1950 enrollment was less than 1,000 at roughly three-quarters of all institutions. Since then, the percentage of institutions having fewer than 1,000 students has decreased substantially while the percentage of institutions in each of the other categories has increased. In 1950 only one of every fifty institutions had more than 10,000 students; in 1976 the comparable figure was approximately one of every twelve.

Still further information about size comes from Table 7 which concerns the nation's largest campuses. In 1975 there were twenty-seven campuses each having over 30,000 students. Overwhelmingly, these institutions tend to be public universities. Of the

TABLE 5*

Average Enrollment in Public and Private Institutions in 1950, 1960, and 1975

	1950	1960	1975
Total Enrollment (in thousands)	2,297	3,610	11,291
Total Number of Institutions	1,859	2,040	3,055**
Average Enrollment	1,235	1,770	3,696
Private Enrollment (in thousands)	1,142	1,474	2,395
Number of Private Institutions	1,221	1,319	1,601
Average Private Enrollment	936	1,118	1,496
Public Enrollment (in thousands)	1,154	2,136	8,896
Number of Public Institutions	638	721	1,454
Average Public Enrollment	1,809	2,962	6,118

*Charles Andersen (editor), A Fact Book on Higher Education: Second Issue/1976 (place of publication unlisted: American Council on Education, 1976) p. 76.80; and Charles Andersen (editor), A Fact Book on Higher Education: Third Issue/1976, p. 76.141.

**Note that the total number of institutions identified for 1975 differs slightly from the figure of 3,026 provided by Messrs. Grant and Lind, Digest of Education Statistics, 1976 Edition, p. 79. See below, p.136, note 1.

TABLE 6*

Percentage of All Institutions with Enrollment of Specified Size in 1950, 1960, 1970, and 1976

Year	Under 1,000	1,000-4,999	5,000-9,999	10,000 and Over
1950	76	18	3	2
1960	63	28	5	4
1970	47	37	9	7
1976	42	38	11	8

*Charles Andersen (editor), A Fact Book on Higher Education: Third Issue/1976, p. 76.147.

TABLE 7*

Size Distribution of Campuses with Enrollment of at Least 30,000 in 1975

Number of Students	Number of Campuses
60,000 or above	2
50,000 - 59,999	1
40,000 - 49,999	3
30,000 - 39,999	21

*Grant and Lind, Digest...., p. 84.

twenty-seven only one is private -- Northeastern -- and only seven are not universities. It is also of interest that seven of the twenty-seven are in California, two in Long Beach alone.

The division of institutions into public and private is the most frequently used classification in terms of control, but additional distinctions can also be made, and they are sometimes significant. Table 8 gives further details. Eighty-two percent of all public institutions are controlled in some degree by a state though states share their authority over some of these institutions with localities. Localities themselves control about 15 percent of all public institutions, and, of course, even the federal government runs a few institutions of higher education directly, mostly military academies.

TABLE 8*

Number of Institutions of Higher Education
by Type of Control, 1976-77

Publicly Controlled			1,467
Federal		11	
State		851	
Local		229	
State and local		346	
State related		30	
Privately Controlled			1,608
Independent nonprofit		768	
Organized as profitmaking		55	
Religious control		785	
Protestant	504		
Roman Catholic	242		
Jewish	24		
Other	15		

*Arthur Pedolsky and Carolyn R. Smith, Education Directory: Colleges and Universities, 1976-77, p. xxx.

Based upon number of institutions, the private sector is almost evenly divided between those that do and those that do not have a religious affiliation. Most of those with any religious affiliation are either Protestant or Roman Catholic, and there are about twice as many institutions with a Protestant as with a Catholic affiliation. A few institutions are organized like ordinary businesses with the aim of earning a profit for their owners, but this form of organization is quite atypical in the collegiate sector of postsecondary education.

IV. ENROLLMENT: BACKGROUND AND OUTLOOK

A. Some Background on Enrollment and Degrees

1. Enrollment

From the end of World War II until quite recently, the central theme of American higher education has been the expansion of enrollment. In varying proportions, this growth has resulted from increases in both the college-age population and the fraction of that population actually enrolling in colleges and universities. Either alone would have been sufficient to produce significant growth; together, they produced the period of rapid expansion which is just now coming to its end. The period is frequently regarded as a time when higher education was transformed from an elite to a mass phenomenon.

The Servicemen's Readjustment Act of 1944, commonly known as the GI Bill, by committing the nation to subsidize higher education for veterans, paved the way for a large expansion in enrollment in the late 1940s. Between the fall of 1945 and the fall of 1947, degree-credit enrollment expanded by over 900,000. Postwar enrollment reached a peak in 1949, declined for two years, and then expanded without interruption through 1975.[1] Between 1975 and 1976, total enrollment declined--the decline was about 1.5 percent--for the first time since 1951.[2] In that sense an era has now ended though, to be sure, the not-very-cheerful anticipation of this ending has been with us for several years.

In 1951 there were about 2.1 million students enrolled for degree-credit in the entire system; the comparable number for 1975 is 9.7 million.[3] Table 9 shows the average annual growth and the average annual rate of growth in aggregate degree-credit enrollment for five sub-periods from 1951 through 1975. In both series substantial acceleration was followed by substantial deceleration. Despite the large aggregate growth during the first half of the 1970s, there was already a spreading sense of malaise. The concerns that were expressed are understandable, both because some institutions had already suffered from the slowing of growth and because others realistically expected to do so. This coincidence during the 1970s of continuing growth at a rather substantial rate and increasing malaise is thus a strong indication that the distribution of good and bad fortune between institutions was becoming increasingly uneven.

TABLE 9*

Average Annual Increases and Average Annual Rates of Growth in Aggregate Degree-Credit Enrollment, Selected Sub-Periods, 1951-1975

Period	Average Annual Increase (Number of Students)	Average Annual Rate of Growth (percent)
1951 - 1955	137,768	6.0
1955 - 1960	185,938	6.2
1960 - 1965	388,719	9.1
1965 - 1970	478,765	7.5
1970 - 1975	362,256	4.2

*Grant and Lind, Digest..., p. 85.

Data are now frequently presented not simply for degree-credit enrollment but for all enrollment, degree-credit plus non-degree-credit. Nearly 1.5 million students were enrolled on a non-degree-credit basis in 1975, and as Table 10 shows, non-degree-credit enrollment has been growing faster than degree-credit enrollment for some time.[4] However, as Table 11 shows, most of this enrollment is concentrated in public two-year institutions, and this pattern seems unlikely to change.

TABLE 10*

Average Annual Rates of Growth in Degree-Credit,
Non-Degree-Credit, and Total Enrollment,
Selected Clusters of Years, 1960-1975

Period	Degree-Credit Rate (percent)	Non-Degree-Credit Rate (percent)	Total Rate (percent)
1960 - 1965	9.1	13.9	9.3
1965 - 1970	7.5	10.8	7.7
1970 - 1975	4.2	17.1	5.4

*Mary A. Golladay, The Condition of Education: 1976 Edition (Washington, U.S. Government Printing Office, 1976), p. 225.

TABLE 11*

Distribution of Non-Degree-Credit Enrollment
by Type of Institution, 1975

Type	Enrollment	Percent
Total	1,453,428	100.0
Public	1,408,736	96.9
Public Two-Year	1,338,559	92.1
Other Public	70,177	4.8
Private	44,692	3.1

*Grant and Lind, Digest..., p. 87.

Already in the previous section there has been some mention of the balance between the public and the private sectors, and as Table 4 shows, roughly three-quarters of total enrollment was in public institutions in 1970. Now this subject deserves additional attention. As Table 12 indicates, at the beginning of the twentieth century the public sector's share of enrollment was just under 40 percent. For the two decades before 1919-20, and the two and one-half following 1949-50, that share grew; from the beginning of the 1920s through the end of the 1940s it was essentially stable.

TABLE 12*

Percentage of All Degree-Credit Enrollment in Public Institutions, Selected Years

Year	Percentage
1899-1900	38.2
1909-10	46.9
1919-20	52.8
1929-30	48.4
1939-40	53.3
1949-50	51.0
1959-60	57.0
1969-70	71.6
1974-75	75.8
1975-76	76.3

*Grant and Lind, Digest..., pp. 7 and 87.

A further perspective on the public-private balance is provided by viewing its geographical variations. Table 13 presents the public share in 1975 for the 50 states and the District of Columbia, ranked from highest to lowest. Based upon the history presented in the second section, it should not come as any surprise that the list shows a marked regional pattern. Private higher education is most important in the northeast and declines to the

TABLE 13*

Percentage of Total Enrollment in Public Institutions, by State, Fall 1975

States Presented in Order of Rank

Wyoming	100.0	Florida	83.6
Nevada	99.4	Georgia	82.2
Arizona	97.2	Nebraska	82.0
Alaska	94.4	South Carolina	81.0
North Dakota	94.0	Minnesota	80.5
Hawaii	92.7	Idaho	80.1
New Mexico	91.7	North Carolina	79.9
Colorado	91.2	Ohio	77.3
California	90.5	Maine	76.9
Mississippi	90.0	Tennessee	76.9
Oregon	89.3	New Jersey	76.7
Kansas	89.2	Illinois	76.1
Washington	89.2	Indiana	74.6
Alabama	88.5	South Dakota	72.5
Montana	88.5	Missouri	70.9
Michigan	88.0	Iowa	68.7
Virginia	88.0	Utah	64.7
Wisconsin	87.5	Connecticut	63.0
Texas	86.8	New York	61.1
West Virginia	86.6	Pennsylvania	61.1
Louisiana	86.2	New Hampshire	59.0
Maryland	85.9	Vermont	58.9
Arkansas	85.6	Rhode Island	50.1
Oklahoma	84.8	Massachusetts	45.1
Kentucky	84.0	District of Columbia	18.0
Delaware	83.6	TOTAL UNITED STATES	79.0

*Grant and Lind, Digest..., p. 80

West and South. Ten states had over 90 percent of their enrollments in the public sector; Massachusetts and the District of Columbia had more than 50 percent of theirs in the private sector.

Of what significance is the relative size of the two sectors? The answer depends upon the value attributed to a sizeable and influential private sector. There certainly does exist a widespread but hardly universal belief that the vitality of the private institutions is a matter of consequence for the system as a whole. Those who especially value the private sector tend to be especially concerned by the prospect that whatever shrinkage lies ahead will occur largely in that sector.

One particular point of concern arises from the outlook for the pool of public-sector and private-sector alumni. There is about the same number of alumni of the 1920s, 1930s, and 1940s in each of those two pools. However, based upon current enrollments, the ratio in which those two pools are now receiving new entrants is about four to one--four new members for the public-sector pool to every one new member of the private-sector pool. Although the exact consequences of this change are hard to foresee, it seems reasonable to expect that it will be unfavorable to the general prosperity of private higher education in the long run.

Though real enough, the problems of private higher education should also be seen in appropriate perspective. The public-private enrollment ratio in the aggregate tells one important part of the story, but there is also other information which provides a different message. For example, the National Science Foundation ranks universities by the dollar value of support for academic science from the major agencies of the federal government which spend these funds. For fiscal year 1975, and by this standard, five of the top ten universities, eleven of the top twenty, and fifteen of the top thirty were private.[5] By this standard--or indeed by any reasonable standard--the private sector is represented with distinction and in force among leading research universities.

Another important indicator is enrollment for the first-professional degree.[6] In the fall of 1975, 58 percent of those so enrolled were in private institutions. The fact that a substantial proportion of lawyers and doctors and all of the clergy obtain professional training in the private sector means that private education will not be without its share of influential spokesmen in the difficult times that all but certainly lie ahead.

What has been the distribution of enrollments by category of institution? Tables 14 and 15 present information for two overlapping, but not identical, schemes of classification: one from the Carnegie Commission and the other from the National Center for Education Statistics.[7]

A general picture that emerges is that about one-third of degree-credit enrollment is in universities, one-quarter is in two-year institutions, and roughly 40 percent is in the other institutions--Comprehensive Universities and Colleges and Liberal Arts Colleges in the Carnegie taxonomy and Other Four-Year Institutions in the NCES' typology. For total enrollment--degree-credit plus non-degree-credit--the importance of the two-year sector rises to roughly one-third, and each of the other sectors shrinks correspondingly.

Table 15 shows the importance of private education in NCES' category, Other 4-Year Institutions, relative to its importance in the other categories and reflects the fact, already underlined in the discussion of Table 4, that liberal arts colleges are almost all private. Table 15 also indicates--as Table 4 did, too--how overwhelmingly public are the two-year institutions.

TABLE 14*

Proportion of Enrollment in Selected Carnegie Categories in 1973

Code of Classification	Title	Percentage
1	Doctoral-Granting Institutions	33.4
2	Comprehensive Colleges & Universities	33.1
3.1	Liberal Arts Colleges I	2.7
3.2	Liberal Arts Colleges II	6.9
4	Public Community Colleges	22.5
	Private Two-Year Colleges	1.4
	TOTAL	100.0

*The Carnegie Foundation for the Advancement of Teaching, More Than Survival: Prospects for Higher Education in a Period of Uncertainty, p. 51.

Another perspective comes from Table 16 which presents enrollment by level and type of program.[8] Undergraduate education is dominant, and the indicated size of the first professional category is quite small. Table 16 also shows that in 1975, 26 percent of all degree-credit undergraduates were enrolled on a part-time basis. In that year, 38 percent of all degree-credit students were enrolled on a part-time basis. Together, these two percentages imply that in 1975, 68 percent of all candidates for graduate and professional degrees were enrolled part-time.[9] The proportion is strikingly large.

TABLE 15*

Percentage of Enrollment in Particular
NCES Categories of Institutions in 1975

Category	Degree-Credit Enrollment			Total Enrollment		
	Total	Public	Private	Total	Public	Private
Universities	34.6**	27.1	7.6	30.5	23.9	6.6
Other 4-Year Institutions	39.6	24.6	15.0	34.9	21.6	13.3
2-Year Institutions	25.8	24.7	1.1	34.6	33.4	1.2
TOTAL	100.0**	76.4	23.7	100.0	78.9	21.1

*Grant and Lind, Digest..., p. 87.

**Detail does not add precisely to total, horizontally, because of rounding.

TABLE 16*

Degree-Credit Enrollment in 1975
by Broad Type of Program
(millions of students)

Total	Undergraduate	First-Professional	Graduate	Unclassified
9.7	7.2	.24	1.3	1.0
	full-time 5.3 part-time 1.9			

*Grant and Lind, Digest..., p. 87.

The development of part-time enrollment can be traced since 1965. In that year 29 percent of all degree-credit enrollment was part-time so that, for the decade from 1965-75, the percentage of all degree-credit enrollment that was part-time grew by about one point per year.[10] Thus, although students in the typical mold--full-time undergraduates--are a substantial proportion of the total, the role of the part-time student has been expanding and seems likely to continue to do so.

2. Degrees

The practical result of higher education is often measured in terms of degrees obtained. Such a measure is at once both crude and yet useful. There is not a neat one-to-one correspondence between enrollments and degrees because of such things as withdrawing from a program before its completion and transferring from one college to another, to cite but two examples. The various kinds of slippage mean that the relations between enrollments and degrees are quite complex. Without exploring this slippage it is desirable to examine the number and variety of degrees awarded. Table 17 presents some information on this subject for 1974-75. Bachelor's degrees predominate; doctorates and first-professional degrees are a relatively small proportion of the total. The proportions in which men and women obtained degrees varied. Women obtained about forty-five percent of the bachelor's and master's degrees, about one-fifth of the doctorates, and only one-eighth of the first-professional degrees. It is important to

TABLE 17*

Earned Degrees, 1974-75

(in thousands; Percentage Distribution by Level, and Share of Each Level Earned by Women)

Type	Number	Percent of total earned degrees	Percent earned at each level by women
Bachelor's	923	70.9	45.4
First-professional	56	4.3	12.5
Master's	294	22.4	44.9
Ph.D. or equivalent	33	2.5	21.9
TOTAL	1,315	100**	43.3

*Charles Andersen (editor), A Fact Book on Higher Education: Fourth Issue/1976 (place of publication unlisted: American Council on Education, 1976), p. 76.213.
National Research Council, Summary Report 1976 Doctorate Recipients from United States Universities (place of publication unlisted: National Academy of Sciences, 1977), p. 5.

**Detail does not add precisely to total because of rounding.

TABLE 18*

Average Annual Rates of Growth in Number of Degrees Awarded, Selected Clusters of Years, 1960-61 to 1974-75

Period	Bachelor's	First professional**	Master's	Ph.D. or Equivalent
1960-61 - 1964-65	7.8		9.4	11.7
1964-65 - 1969-70	10.1		13.3	12.6
1969-70 - 1974-75	3.1	9.8	7.0	2.2

*Charles Andersen (editor), A Fact Book on Higher Education: Fourth Issue/1976, pp. 76.216-76.219.
National Research Council, Summary Report 1976 Doctorate Recipients, p. 5.

**A change in the definition of first-professional degree as of 1965-66 makes it advisable simply to omit data for the earlier periods.

remember that two-year undergraduate colleges ordinarily award some sort of certificate, not a full-fledged degree. About one-third of all degree-credit undergraduates attend such colleges and are thus not candidates for bachelor's degrees from the institutions in which they are enrolled. Of course they may subsequently apply to continue their educations in degree-granting institutions.

Table 18 shows the rate of growth of degrees awarded since the beginning of the 1960s. Broadly speaking, the growth of degrees should follow the growth in enrollment with a lag. We are not now going to explore these relationships with great precision, but there are a few observations worth making. Aggregate enrollments and bachelor's degrees awarded a half decade later show a rough correspondence in their growth rates. For doctorates, both acceleration and subsequent deceleration in degrees awarded has been more pronounced than for the bachelor's. Another point of interest is the relatively rapid rate of growth in the 1970s for both master's and first-professional degrees, in comparison with the growth for either the bachelor's or the doctorate.

Table 19 presents some information on the ratio of degrees awarded to candidates for degrees.[11] For each degree, there was essentially no difference between the public and private sectors, and even though one would have to know a great deal more than just these numbers to draw any firm conclusions about rates of retention in the two sectors, the result is intriguing and worth bearing in mind.

TABLE 19*

Degrees Awarded as a Percentage of
Candidates Enrolled in Degree-Granting Programs,
Selected Degrees, by Sector, 1975-76

	Percent	
	Public Sector	Private Sector
Bachelor's Degrees / Undergraduates in degree-granting institutions	20.2	19.6
First-Professional Degrees / Enrollment in first-professional programs	25.4	26.5

*Grant and Lind, Digest..., p. 87.

"Earned Degrees Conferred in 1976," The Chronicle of Higher Education, October 11, 1977, p. 10.

An important final point that emerges from this discussion of degrees is that the vocational content of the bachelor's degree covers a broad spectrum. In some cases the education leading to the degree has been focused quite specifically upon training for a vocation; in other cases, there has been little or no specific and direct connection. The earlier discussion of historical themes certainly suggested this diversity, and the information in Table 20 serves to confirm it. The table contains a moderately detailed, but not absolutely all-inclusive, list of the fields in which bachelor's degrees are awarded and the number of degrees awarded in each category in 1974-75. Even if all the degrees awarded under the rubrics

TABLE 20*

Number of Bachelor's Degrees
Awarded by American Institutions
of Higher Education,
by Selected Categories, 1974-75
(in thousands)

Agricultural and Natural Resources		17.5
Animal Science	3.4	
Fish, Game and Wildlife Management	1.5	
Forestry	2.6	
Other Agriculture and Natural Resources	10.0	
Biological Sciences		51.7
Business and Management		133.8
Accounting	31.1	
Other Business and Management	102.7	
Communications		19.2
Journalism	7.1	
Radio-Television	3.3	
Other Communications	8.8	
Computer and Information Sciences		5.0
Education		167.0
Elementary Education, General	68.7	
Music Education	8.0	
Physical Education	24.6	
Other Education	65.7	
Engineering		46.9
Fine and Applied Arts		40.8
Foreign Languages		17.6
Health Professions		49.1
Nursing	23.7	
Pharmacy	6.3	
Speech Pathology and Audiology	3.7	
Medical Laboratory Technologies	5.0	
Other Health Professions	10.4	
Home Economics		16.8
Family Relations and Child Development	3.6	
Foods and Nutrition	2.4	
Other Home Economics	10.8	

Table 20
(continued)

Letters		57.6
English, General, and English Literature	39.0	
Speech, Debate, and Forensic Science	7.0	
Philosophy	5.3	
Other Letters	6.3	
Mathematics		18.2
Physical Sciences		20.8
Physics, General	3.6	
Chemistry, General	10.4	
Geology	3.2	
Other Physical Sciences	3.6	
Psychology		51.0
Public Affairs and Services		28.2
Social Work and Helping Services	10.4	
Law Enforcement and Corrections	10.0	
Parks and Recreation Management	4.5	
Other Public Affairs and Services	3.3	
Social Sciences		135.7
Anthropology	5.6	
Economics	14.0	
History	31.5	
Political Science and Government	29.1	
Sociology	31.5	
Other Social Sciences	24.0	
All Other		46.1
TOTAL BACHELOR'S DEGREES		923

*Grant and Lind, *Digest...*, pp. 117-122.

of the several sciences, mathematics, the arts, languages and letters, psychology, and the social sciences are regarded as not vocationally oriented--presumably both an oversimplification and an overestimate--then the balance of the degrees which -- however their recipients ultimately use them -- are vocationally oriented, accounts for almost exactly 60 percent of the total.

B. The Outlook

1. A Wide Range of Possibilities

For American higher education, the late 1950s and most of the 1960s was a "go-go" period. There was an aura of relative prosperity as well as a spirit of dynamism. Above all, there were plenty of students to go around. Now things have changed, and above all, there is a widespread worry that there won't be enough students. Some institutions have already closed for lack of students, and others are in jeopardy. The need for salesmanship has come to much of higher education.

What is in store for enrollment? This question brings to mind the answer once given to the question, "What will the stock market do?" The answer--the only answer in which one can have great confidence--was, "It will fluctuate." Obviously no one knows for sure what will happen to enrollment. The range of possibilities receiving serious attention contains enormous variation.[12]

The tone of comments by Howard Bowen and Stephen P. Dresch well represent this range. Although recognizing that things might easily work out differently, Bowen at least allows himself to envision as a not-out-of-the-question result that "the higher education industry might well double or treble in size during the balance of this century."[13] By contrast, Dresch presents a model which implies "that the level of enrollment in the late 1990s will be about one-half its peak, and approximately equal to its level in the late 1960s."[14] Of course there are other and less extreme views, and a main conclusion from the wide range of possible outcomes receiving serious attention is how uncertain this whole subject is. The uncertainty is not surprising since the actual outcome depends on a variety of decisions which have not yet been made, including some important public policy decisions.

What is quite clear is that the broad momentum of expansion in enrollment for the system as a whole has changed. What prompted that momentum of the 1960s? As we have already mentioned, the traditional college-age population was growing, and an increasing proportion of that population was seeking higher education. The labor market was reinforcing these trends by providing attractive opportunities for the large number of graduates emerging ready for work. Indeed, the expanding educational system itself welcomed many of the graduates as teachers at all levels. Then, too, encouraged by social policy and a pervasive collective frame of mind, women and minorities were beginning to participate at rates that, by historical standards, were notably high. The federal government was pursuing a variety of policies that had the effect of bolstering enrollments, especially in the sciences. Finally, an unpopular war helped increase the demand for education in two ways. First, until 1970, enrollment served as a shield from the draft. Second, educational subsidies were available as benefits for veterans.

2. The Demography

Now the momentum has ended. To understand the processes at work, we must examine several factors. The underlying demography is one. The rate of growth of the college-age population--usually regarded as including 18-21-year-olds or 18-24-year-olds--has decreased. This result is suggested simply from the numbers in Table 21: the annual number of live births for 1945 through 1976.[15] Not since 1945 had there been as few births as there were in 1975, and the comparison takes on added significance viewed in this context: America's population was only 140 million in 1945; it was 214 million--53 percent larger--in 1975.[16] The series reached its peak in 1957 when there were 51 percent more births than in 1945. Since 1957, there has been an almost steady decline, and the number of births in 1976 was 27 percent below its level in 1957.

From the perspective of college admissions officers in the aggregate, these numbers give a vivid sense of their institutions' problems. Typically, members of the cohort born in 1975 will be ready to enter college in 1993. Obviously, not all members of each cohort attend college, the proportion of those going varies over time, and not all who eventually do go first enroll when they are approximately eighteen years old. But leaving these matters aside for the moment and focusing only on the broader point, we can see the general problem: when admissions officers are filling the class of 1997 which will enter in 1993, the pool of prime candidates, defined in the usual way, will be less by about a quarter than it was when, during 1975,

TABLE 21*

Number of Live Births in the United States
1945-1975 (in millions)

1945	2.86	1956	4.22	1967	3.52
1946	3.41	1957	4.31	1968	3.50
1947	3.82	1958	4.26	1969	3.57
1948	3.64	1959	4.26	1970	3.72
1949	3.65	1960	4.23	1971	3.56
1950	3.63	1961	4.27	1972	3.26
1951	3.82	1962	4.17	1973	3.14
1952	3.91	1963	4.10	1974	3.16
1953	3.97	1964	4.03	1975	3.15
1954	4.08	1965	3.76	1976	3.17
1955	4.10	1966	3.61		

*Charles Andersen (editor), A Fact Book on Higher Education: First Issue/1976 (place of publication unlisted: American Council on Education, 1976), p. 76.28.

U.S. Public Health Service, National Center for Health Statistics, Monthly Vital Statistics Report, Vol. 25, No. 12 (March 18, 1977).

the class of 1979 was being admitted. Is it very surprising that so much is now beginning to be heard about adult education and related topics?

The fertility rate, defined as the annual number of live births per 1000 women 15-44 years old, provides additional perspective on the relevant demography. The rate was 126.8 in 1910, reached a low point for the era of the depression of 75.8 in 1936, rose to a peak of 122.7 in 1957, and then fell steadily to 72.6 in 1973.[17] At that point it was, for the first time, the rate consistent with zero growth of population in the long run.[18] Although the rate went up in the first few months of 1977, it is too soon to tell whether there has been a genuine turning point, a question attracting much speculation.[19]

The implications of these trends are clear. Education at all levels has been or will be affected in turn as expansion for particular age groups turns to contraction. Table 22 shows the year in which each of a number of age groups has reached or will reach its maximum size.[20] The turning points for the primary and secondary school populations have passed; that for the college-age population, as traditionally defined, is just ahead.

Identifying turning points is only part of the story; after all, one turning point may always be followed by another. What is in store for these populations in the foreseeable future? For the 18-year-old, 18-21-year-old, and 18-24-year-old populations, we can see ahead until 1994 without relying on inevitably speculative forecasts of fertility. Estimates for these three age groups from 1978 through 2000 appear in Table 23.[21] For a little while, all three will continue to grow, and then a long period of decline will begin. The group of 18-24-year-olds will decrease from 1981 until 1996 when it will be 23 percent smaller than at its peak. The group of 18-21-year-olds will decrease, almost without exception, from 1979 until 1994, reaching a level 24 percent below its peak. The number of 18-year-olds will decline, also almost without exception, from 1979 until 1994 when it will be 25 percent smaller than at its peak.

Overwhelmingly, students attend college in their state of residence. The tie is stronger for those attending public institutions

TABLE 22*

Year When Particular Age Groups Reach a Maximum Size

Age Group	Peak Year
5-13	1968
14-17	1974
18	1979
18-21	1979
18-24	1981

*Kenneth A. Simon and Martin M. Frankel, _Projections of Educational Statistics to 1983-84, 1974 Edition_ (Washington: U.S. Government Printing Office, 1975), pp. 153-54.
U.S. Bureau of the Census, _Current Population Reports_, Series P-25, No. 704, pp. 37ff.

than for those attending private ones. It is thus useful to consider how aggregate demographic trends will vary among the states. Internal migration is a tricky phenomenon to forecast, all the more so for a segment of the population, and thus the results must be used cautiously.

Table 24 presents the Census Bureau's forecasts of the percentage change in the 18-24-year-old population between 1980 and 1985 by regions and states. For the fifty states and the District of Columbia, the decrease will be 4.1 percent, and barring the bizarre, that percentage will not change. The more speculative state-by-state forecasts vary from an increase of 6 percent for the District of Columbia to a decrease of over 10 percent for West Virginia. Only the District of Columbia and four states--California, Florida, Arizona, and New Mexico--are expected to show increases, and for Alaska the forecast is for no change.

TABLE 23*

Estimated Size of Particular Age Groups
1978 - 2000
(in millions)

Year	Age-Groups		
	18	18-21	18-24
1978	4.23	17.11	28.98
1979	4.29	17.16	29.30
1980	4.21	17.12	29.46
1981	4.15	17.02	29.51
1982	4.09	16.87	29.36
1983	3.92	16.50	29.02
1984	3.70	15.99	28.48
1985	3.60	15.44	27.85
1986	3.52	14.87	27.08
1987	3.57	14.52	26.45
1988	3.65	14.47	25.97
1989	3.73	14.60	25.63
1990	3.43	14.51	25.15
1991	3.24	14.18	24.69
1992	3.17	13.69	24.24
1993	3.25	13.20	23.96
1994	3.20	12.97	23.59
1995	3.26	13.00	23.22
1996	3.36	13.18	22.86
1997	3.49	13.43	22.94
1998	3.65	13.89	23.35
1999	3.81	14.44	23.99
2000	3.91	14.99	24.65

* U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 704, pp. 37-60.

TABLE 24*

Percent Change in the 18-24-Year-Old Population, by Region and State, 1980 - 1985

Region and State	Percent Change
50 STATES & D.C.	-4.1
NEW ENGLAND	-4.2
Connecticut	-5.2
Maine	-3.7
Massachusetts	-3.5
New Hampshire	-5.0
Rhode Island	-5.4
Vermont	-3.6
MIDEAST	-5.2
Delaware	-3.4
D.C.	6.0
Maryland	-2.9
New Jersey	-4.3
New York	-4.8
Pennsylvania	-8.7
SOUTHEAST	-3.6
Alabama	-5.6
Arkansas	-4.8
Florida	2.9
Georgia	-3.5
Kentucky	-6.9
Louisiana	-2.8
Mississippi	-5.5
North Carolina	-4.6
South Carolina	-4.5
Tennessee	-6.7
Virginia	-3.6
West Virginia	-10.3
GREAT LAKES	-6.2
Illinois	-3.9
Indiana	-5.2
Michigan	-9.2
Ohio	-7.0
Wisconsin	-4.9
PLAINS	-6.6
Iowa	-7.0
Kansas	-8.9
Minnesota	-5.4
Missouri	-6.3
Nebraska	-6.6
North Dakota	-7.9
South Dakota	-4.5
SOUTHWEST	-2.8
Arizona	3.0
New Mexico	3.2
Oklahoma	-5.8
Texas	-3.8
ROCKY MOUNTAINS	-3.3
Colorado	-3.3
Idaho	-6.2
Montana	-6.1
Utah	-4.1
Wyoming	-2.2
FAR WEST	-0.2
Alaska	0
California	1.1
Hawaii	-3.0
Nevada	-6.0
Oregon	-8.2
Washington	-3.5

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*Charles Andersen (editor), A Fact Book on Higher Education: First Issue/1976, pp. 76.16-76.17.

We can summarize the discussion of the underlying demography very simply. Growth of the traditional college-age population has been an important factor in the growth of higher education's enrollment for the past several decades. Between 1960 and 1980 the size of the 18-24-year-old population will have increased from 16 to 29 million, a growth of 83 percent. By contrast, it will decrease for most of the rest of the century, and in 2000 is expected to be smaller by 18 percent than it was in 1980. For a long time into the future, continuing growth in the 18-24-year-old population will no longer be available as it now has been for several decades as a source of growth in aggregate enrollment in higher education.

3. Completing High School and Attending College: Some Linkages

There are factors other than demography which have an important influence on aggregate enrollment. The first is the proportion of people in the relevant ages who enter higher education. The linkage between population and enrollment is quite loose, and--viewing matters from the perspective of institutions which need students--there is at least the possibility of making up through higher participation rates what is lost through population shrinkage.

There is a conceptual matter worth attention at this point: the nature of the linkage between the size of a particular population--say, the number of 18-year-olds in a particular year--

and the number of people with a particular educational attainment--say, the number of high school graduates in the same year. All high school graduates are not eighteen years old when they graduate; some are older, and some are younger. As a way of acknowledging the important point that the one population with which we are dealing--high school graduates--is not necessarily fully contained within the other--18-year-olds--we shall refer to ratios rather than percentages.[23] The general point is that phrases like, "the high school graduation rate" sometimes do not mean exactly what the words suggest. However, the ratio and others like it are indeed meaningful and useful because of their stability over time.

Today virtually everyone completes elementary school, but far from everyone completes high school, and far from everyone who completes high school enters college. The ratios which approximate these relationships since 1950 appear in Table 25. The ratio of high school graduates to 18-year-olds, which was low in 1950, has been low for a large part of this century. It was about 30 percent in the early 1930s.[24] In the early 1940s it reached 50 percent, and it is now about three-quarters. The numbers in column 3 mean that the proportion of the population getting at least some higher education was about one-quarter in the early 1950s and between two-fifths and one-half more recently. But equally important, the increase in the proportion of those graduating from high school appears to have been an extremely important ingredient in the growth of the proportion of the cohort going to college. In the period to come colleges collectively have a great stake in an increase in the high school graduation rate.

The numbers in Table 25 may be viewed as appropriately weighted averages of the ratios for males and females, and it is worth comparing the separate ratios. Several decades ago the high school graduation rate for males was about ten percent below the rate for females, and only in fairly recent years has this difference been approximately eliminated.[25] Regarding high school graduates' participation in college, since the mid-1950s the ratio for males has fluctuated but not grown systematically; it was .625 in 1954 and .620 in 1973. For females, on the other hand, the ratio has been growing fairly steadily, and whereas in 1954 it was only 58 percent as large as the ratio for males, the difference has been diminishing. In 1973, when the ratio for males was .620, for females it was .538, or 85 percent as large.

The upshot of this discussion of the size of the 18-year-old population, the proportion of that population graduating from high school, and the proportion of the high school graduates going on to college is that there is still some room for the relevant ratios to increase. Such a change would tend to increase aggregate enrollment while the decrease in the traditional college-age population was working in the other direction. How things will work out is obviously uncertain and depends upon, among other things, a variety of political decisions yet to be made. Cartter's roughly middle-of-the-range forecasts for 1990 were a high school graduation ratio of .836 and a ratio of first time degree-credit enrollment to high school graduates of .665.[26] These numbers imply a ratio of first-time enrollment to the population of 18-year-olds of .556 in 1990 as opposed to .455 in 1976.

TABLE 25*

Relationships Between the 18-Year-Old Population, High School Graduates, and First-Time Degree-Credit Enrollment in College, Selected Years, 1950-1976

Year	High School Graduates / 18-Year-Olds	First-Time Enrollment / High School Graduates	First-Time Enrollment / 18-Year-Olds
1950	.555	.427	.237
1952	.581	.445	.259
1954	.598	.490	.293
1956	.631	.505	.319
1958	.653	.513	.335
1960	.726	.495	.359
1962	.689	.535	.369
1964	.824	.535	.441
1966	.757	.516	.391
1968	.771	.603	.465
1970	.782	.615	.481
1972	.766	.579	.443
1974	.753	.611	.460
1976	.740	.615	.455

*Cartter, Ph.D.s and the Academic Labor Market, p. 50.

U.S. Bureau of the Census, Statistical Abstract of the United States: 1976 (97th Annual Edition, Washington: U.S. Government Printing Office, 1976), p. 140.

Charles Andersen (editor), A Fact Book on Higher Education: Second Issue/1976, p. 76.102.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 643, "Estimates of the Population of the United States, By Age, Sex, and Race: July 1, 1974 to 1976," (Washington: U.S. Government Printing Office, 1977), pp. 10, 12.

These ratios are national averages; it is important to remember that there is some state-by-state variation. One measure of it is the ratio of student residents--residents of the state who are enrolled in institutions of higher education anywhere--to the 18-24-year-old population. The states have been ranked on the basis of this ratio, and the results appear in Table 26. These results provide a rough measure of interstate differences in participation in higher education. From the point of view of opportunities for young people, residence in New York or California appears to imply a much greater likelihood of attending college than living in Kentucky, Arkansas, or Georgia. But considered from the perspective of opportunities to locate new pools of applicants, the states with low current rates of participation may be more promising than those in which nearly as large a proportion as is realistically likely to attend college is already doing so.

4. Demand for the Highly Educated and Demand for Higher Education: Some Linkages

Another relationship which bears on the future of enrollment is the connection between enrollment and opportunities for employment. Not all demand for higher education is motivated by the straightforward expectation of financial reward, but surely enough of what we characterize as higher education is directed towards training for a vocation to justify explicit consideration of this aspect of demand. The underlying notion is that, in some instances, the purchaser of higher education can be seen as making an

TABLE 26*

Ratio of Student Residents to the Size of the 18-24-Year-Old Population, by State, in 1975

California	.577	Wyoming	.360
New York	.500	New Mexico	.359
Rhode Island	.491	West Virginia	.357
Arizona	.486	Colorado	.356
Washington	.475	Idaho	.356
New Jersey	.474	Iowa	.354
Connecticut	.471	Pennsylvania	.351
Oregon	.470	Florida	.349
Massachusetts	.468	South Dakota	.344
Nevada	.437	Hawaii	.343
Illinois	.436	Alabama	.340
Delaware	.412	Virginia	.340
Maryland	.411	Montana	.337
District of Columbia	.406	Mississippi	.333
Oklahoma	.404	South Carolina	.331
Wisconsin	.403	Ohio	.326
Kansas	.389	Tennessee	.319
Michigan	.389	North Carolina	.331
Minnesota	.385	Maine	.310
North Dakota	.384	Indiana	.297
Missouri	.369	Alaska	.295
Utah	.367	Louisiana	.282
New Hampshire	.364	Kentucky	.276
Nebraska	.363	Arkansas	.273
Texas	.361	Georgia	.251
Vermont	.361	AGGREGATE	.401

*Estimates of the 18-24-year-old population were provided by the U.S. Bureau of the Census. The data on student residents come from Grant and Lind, Digest..., p. 83.

investment; when the prospective returns on the investment are not sufficiently high, it will not be made.

In the abstract, this notion is attractive. However the conclusions that can be based on it depend heavily on what information is emphasized in applying it. Reference has already been made to Dresch's work, which points to a massive reduction in the demand for higher education. He derives this conclusion by applying the investment concept in the following way. The starting point is that there was a shortage of college-educated labor just when the college-age population was particularly small because of the low birthrates of the Depression of the 1930s. The response to this shortage was straightforward; more people went to college. The proportion going to college thus became much larger and a particular proportion, once reached, has a tendency to persist as a social habit. By the time developments in the labor market should have led to a reduction in the demand for higher education on grounds of economic rationality, the absolute size of the college-age population had grown greatly. Further, the social pattern which was prompting many to attend college slowed the pace of adjustment to the reduced demand for college-trained labor. Thus the resulting surplus of college-trained labor became severe, and the process of adjustment more protracted, than they might have been if economic rationality in the narrow sense had been the only principal force at work.[27]

Richard Freeman makes a broadly similar argument though his view of the future for higher education in the aggregate is not so explicitly gloomy.[28] He argues that, with selected exceptions, the market for those with higher education has been depressed during the 1970s and is likely to remain so into the 1980s. He finds broad empirical support for the proposition that the state of the job market has an important influence on whether people seek higher education and what they study. For example, he notes that, between 1969 and 1974, the proportion of 18-24-year-old males, who were enrolled in college, declined from 35.2 to 27.8 percent, and he finds evidence suggesting "that the depressed market weakened the 'go to college norm' in all social strata."[29] His general comment on these findings is of great interest:

> The fall in enrollments from the middle and upper classes represents a major change in the traditional pattern of intergenerational mobility; for the first time, large numbers of young persons appeared likely to obtain less schooling and potentially lower occupational status than their parents.[30]

There is a somewhat more impressionistic application of the education-as-investment logic which leads in the other direction. It comes from Howard Bowen whose vision of the possibility of great expansion we have already noted. Bowen emphasizes the expansion of the service sector relative to the goods-producing sector. Focusing upon what he calls the professional category of the service sector, he writes, "by the year 2000 this category might well employ 40 percent of the whole work force."[31] Demand for more workers in this category will in turn result in increased demand for higher education. In one sense, Bowen's forecast simply contradicts Dresch's and Freeman's. However, it also seems appropriate to emphasize not so much the contradiction but rather that they all employ the education-as-investment approach with Bowen giving especially heavy weight to one particular source of demand for highly educated labor and thus for higher education.

These views are directed rather generally to the demand for highly educated labor and the resulting demand for higher education in the aggregate. There is also more explicit information concerning particular job markets and the demand for particular programs of study. Of course, it takes time for changing information about job markets to be translated into changes in the number of degrees awarded. For example, the Ph.D. recipient in 1976 typically first enrolled as a candidate for that degree in the beginning of the 1970s, and the decision to enroll was made on the basis of information available then. Such lags are an important ingredient in the process of adjustment.[32]

In the market for Ph.D.s, the buoyancy of the 1960s has been replaced by an atmosphere of gloom; what was to some extent a seller's market has become, to a large extent, a buyer's market. The pages of The Chronicle of Higher Education gave ample testimony during 1976-77 of how unpleasant things have become for many seeking jobs.

Of course there is not just one market for Ph.D.s. Over the past several decades roughly 60 percent of new Ph.D.s have been going to work in colleges and universities, but as Table 27 indicates, the proportion varies widely by field.[33] Dependence on employment in the academic sector is greatest in the humanities and least in the sciences, with the social sciences coming between the extremes.

Has the message about the depressed state of the market for Ph.D.s been getting through to prospective graduate students? Data on the aggregate number of Ph.D.s awarded appear in Table 28 and give some information on this point. Of course while considering these data we should keep in mind the problem of lags and the fact that there are separate markets for each discipline. The total number of Ph.D.s awarded peaked in 1973 and then remained virtually stable through 1976. For men it peaked in 1972 and then fell by 9 percent between 1972 and 1976 whereas for women there has been

TABLE 27*

Percent of New Ph.D.s Employed
in the Academic Sector in 1973,
for Selected Disciplines

Discipline	Percent
English	91.7
Foreign Language and Literature	91.2
History	85.5
Political Science	77.7
Mathematics	77.2
Economics	70.1
Biosciences	65.5
Psychology	54.0
Physics	39.1
Chemistry	35.9
Earth Sciences	35.9
Engineering	27.7

*Cartter, Ph.D.s..., p. 225.

uninterrupted growth. Indeed between 1972 and 1976 the number of Ph.D.s awarded to women increased by 45 percent. Given the small number of women with Ph.D.s, and the special efforts now being made to recruit them, this development probably represents a straightforward response to professional opportunities.

TABLE 28*

Doctorates Awarded
1966-76

Year	Men	Women	Total
1966	15,863	2,090	17,953
1967	17,944	2,440	20,384
1968	19,985	2,931	22,916
1969	22,338	3,386	25,724
1970	25,508	3,967	29,475
1971	27,187	4,585	31,772
1972	27,719	5,282	33,001
1973	27,645	6,082	33,727
1974	26,585	6,415	33,000
1975	25,720	7,193	32,913
1976	25,247	7,676	32,923

*National Research Council, _Summary Report 1976 Doctorate Recipients..._, p. 5.

Another and also useful way of pursuing the basic question is to examine trends in the number of Graduate Record Examinations administered in particular disciplines. Some data appear in Table 29. Biology is the one area which expanded by this index between 1970-71 and 1976-77, and the unsatisfied demand for places in medical schools plus the interest in ecology make this result logical.

In every other field, there was a decline between 1970-71 and 1976-77; it was greatest in history, smallest in chemistry and psychology.

TABLE 29*

Number of Graduate Record Examinations Taken in 1968-69, 1970-71, and 1976-77 and Percentage Change Between 1970-71 and 1976-77, Selected Fields

Field	1968-69	1970-71	1976-77	Percent Change 1970-71 to 1976-77
Biology	9,879	14,575	18,300	+26
Chemistry	4,715	5,432	4,500	-17
Economics	3,823	4,915	3,000	-39
Engineering	7,594	8,496	5,500	-35
French	2,402	2,587	900	-65
History	9,041	11,471	3,500	-69
Literature	13,176	15,357	5,900	-62
Mathematics	6,406	7,601	3,200	-58
Philosophy	1,490	1,655	700	-58
Physics	4,280	4,015	2,650	-34
Psychology	12,354	18,441	15,300	-17

*These data were provided by Educational Testing Service. The figures for 1976-77 are estimates.

The cases of history and psychology provide an interesting comparison; the number of undergraduate majors has been decreasing in the former and increasing in the latter. Between 1969-70 and 1974-75 the number of bachelor's degrees declined by 27 percent in history--approximately from 45,000 to 34,000 -- and increased by 52 percent in psychology -- roughly from 34,000 to 51,000. Whereas for bachelor's degrees as a whole there are only expected to be 5 percent more awarded in 1983-84 than in 1973-74, the increase in psychology is expected to be 47 percent.[35] On this basis, relatively better opportunities to teach can be anticipated in psychology than in a variety of other disciplines, including history. The apparent relative strength of demand for graduate training in psychology relative to history is thus what one might expect.

Factors other than conditions in the market for Ph.D.s influence enrollment in graduate programs. One is the cost of attending graduate school. Federal financial support for graduate students is one index of the price, and as Table 30 makes abundantly clear, that support declined dramatically following 1968. Thus, changes in the number of graduate educations which the federal government subsidizes tended to reinforce the incentives being provided independently by the job market. An additional factor of some significance is that particular departments in some universities began a number of years ago to admit fewer students for the Ph.D. The impact of this factor in the aggregate is unknown, but it has been a force on the supply side of the market for graduate education.[36]

TABLE 30*

Number of Graduate Students Supported
on Federal Fellowships and Traineeships,
Fiscal Years 1961 - 1974

1961	11,591	1968	51,446
1962	13,528	1969	42,551
1963	15,601	1970	33,240
1964	20,442	1971	28,973
1965	26,425	1972	24,808
1966	40,007	1973	19,649
1967	51,289	1974	6,602**

*Richard B. Freeman and David W. Breneman, Forecasting the Ph.D. Labor Market: Pitfalls for Policy (Washington: National Board on Graduate Education, 1974), p. 13.

**Estimate

It appears that conditons in the market for Ph.D.s have made themselves felt in the demand for graduate education although other forces may also have been at work. Has the adjustment gone far enough? It may be helpful to present the perspective from the second half of the 1960s. Based upon a variety of information from surveys, Lewis B. Mayhew reported the following in 1970:

> Although estimates vary, all indications are that graduate and postbachelor professional training is and will remain the fastest-growing segment of American higher education, expanding at an even more rapid rate than junior college enrollment. Allan Cartter (1968) estimates that graduate enrollment will increase to approximately 2.5 million by 1980 (the size of the total collegiate enrollment in 1952) and that the annual production of doctorates will have expanded from 9,800 in 1960 to 50,000 in 1980. His estimates are generally conservative. The U.S. Office of Education (1969) estimates that the...100 percent increase in the number of both master's degrees and doctorates awarded for the decade 1958-68 will continue or increase during the decade of the seventies. As the U.S. Office of Education annually amends its estimates, the projected figures become larger, with the most recent suggesting that the annual doctorate production in 1980 will be approximately 60,000....In 1969 approximately 400 institutions responded to a questionnaire asking how many degrees of various types they awarded in 1968 and how many they expected to award in 1980. Applying those rates of increase to the total degrees awarded in 1968 by all institutions, estimates were obtained of...67,519 doctorates to be awarded in 1980. Still another projection arrived at an estimate of 77,000 doctorates. Thus the number of doctoral degrees awarded will probably increase from 26,100 actually conferred in 1968-69 to a number somewhere between 60,000 and 70,000 in 1980.[37]

How different things appeared five years later. Writing in 1975, when the number of Ph.D.s awarded to men had been falling and the total number awarded annually was in the neighborhood of 33,000, Allan Cartter put things this way:

> Thus it appears that the graduate education establishment of 1975 is geared to the unusual growth rates of the mid-1960s, and that, in aggregate, it is turning out Ph.D.s at a rate about one-third above needs in the late 1970s, and is projected to over-produce by about 50 percent or more in the 1980s. Obviously, this conclusion needs to be differentiated by field; in the humanities it is quite apparent that there will be a significant oversupply over the next 5 to 10 years, while in a few fields, such as environmental biology and computer sciences, the surplus is likely to be small or nonexistent. Nevertheless, considerable reduction in the flow of Ph.D.s will be required if there is not to be a serious employment problem facing new doctorate recipients entering the job market.[38]

We may end discussion of Ph.D.s as follows. First, a large adjustment has taken place from the trends in graduate education that prevailed in the second half of the 1960s. With the exception regarding women, the falling off of interest in graduate education in the aggregate has coincided with a marked reduction of opportunities in the aggregate for those with the Ph.D. But second, as things now stand, the current flow of Ph.D.s still appears generally too high to be absorbed comfortably in the labor market during the next decade.[39] One way or the other additional adjustments are in store. Although other things are possible, what seems most likely is that the adjustment will come in part fairly soon through the aggregate flow of Ph.D.s and thus the size of enrollment in graduate school and, in part, later on through the number of Ph.D.s who are unemployed or, what seems more likely, employed in activities not directly related to their professional training. What the balance will be between these two mechanisms of adjustment is, at once, unknown and of great consequence to many people.

We turn now to consider more briefly several other examples of the connection between the job market and the demand for education. The first concerns accounting.[40] In recent years there has been rapid growth in the demand for accountants. In response, enrollment in accounting as a major field of study for undergraduates has grown briskly as Table 31 shows. This growth in enrollment has, in turn, created demand for teachers of accounting. Finding enough qualified teachers has not been easy, and one response has been for universities to limit undergraduate enrollment in accounting. Some anticipate that the demand for accountants will be strong for a long time to come, but others are already expecting a surplus to turn up shortly now that the market has had some time to respond to the initial surge in demand. Whatever develops in the market for accountants, this kind of oscillation from shortage to surplus can be quite characteristic of the market for highly trained labor.[41] Obviously such oscillation has important implications for enrollments and for the financial health of universities and colleges.

Two other areas deserving brief mention are law and medicine. Both professions are exceedingly popular in their own right and perhaps also as a byproduct of the faltering appeal of the Ph.D. as a sound basis for earning a living.

In 1975-76, roughly 32,500 degrees were awarded in law and approximately 13,500 in medicine. The data in Table 32 shown how the flow of new lawyers and doctors has been changing since the mid-1950s. Over this period the number of degrees earned annually has expanded much faster in law than in medicine. In 1954-55 there were 17 percent

TABLE 31*

Earned Bachelor's Degrees in Accounting 1966-67 through 1975-76

1966-67	15,692
1967-68	18,075
1968-69	20,183
1969-70	21,354
1970-71	22,367
1971-72	25,065
1972-73	28,289
1973-74	29,770
1974-75	31,605
1975-76	35,806

*Charles Andersen (editor), A Fact Book on Higher Education: Fourth Issue/1976, p. 76.286. The number for 1975-76 was provided by the National Center for Education Statistics over the telephone.

more new lawyers than new doctors; in 1975-76, the figure was 140 percent. For both professions growth in number of degrees awarded has been rapid, though it has been more rapid in law. Between 1970 and 1976 the number of law degrees awarded annually more than doubled, and the number of medical degrees grew by over 60 percent. Those are dramatic changes in a relatively few years.

Another measure of the popularity of law comes from the data in Table 33 on the number of Law School Admission Tests administered annually. The number roughly tripled between the mid-1960s and the mid-1970s; the contrast with the trend for the Graduate Record Examinations, which serve as an index of interest in graduate programs in the arts and sciences, is striking.

TABLE 32*

Number of First Degrees Conferred in Law and Medicine 1954-55 through 1975-76

Year	Law	Medicine
1954-55	8,209	7,014
1955-56	8,262	6,810
1956-57	8,794	6,744
1957-58	9,394	6,816
1958-59	9,856	6,825
1959-60	9,240	7,032
1960-61	9,429	6,940
1961-62	9,364	7,138
1962-63	9,884	7,231
1963-64	10,679	7,303
1964-65	11,583	7,304
1965-66	13,246	7,673
1966-67	14,663	7,723
1967-68	16,454	7,944
1968-69	17,053	8,025
1969-70	14,916	8,314
1970-71	17,421	8,919
1971-72	21,764	9,253
1972-73	27,205	10,307
1973-74	29,326	11,356
1974-75	29,296	12,447
1975-76	32,535	13,540

*Grant and Lind, Digest..., p. 123.

TABLE 33*

Number of Law School Admission Tests Administered Fiscal Year 1965-66 through Fiscal Year 1976-77

Fiscal Year	No. of Tests Administered
1965-66	44,905
1966-67	47,110
1967-68	49,756
1968-69	59,050
1969-70	74,092
1970-71	107,479
1971-72	119,694
1972-73	121,262
1973-74	135,397
1974-75	133,546
1975-76	133,320
1976-77	128,135

*These data were provided by Educational Testing Service (ETS). The fiscal years are those of ETS.

There is a great deal that can be said about the demand for medical education, but a rather small amount of information says almost everything: tuition for the first-year class at Georgetown University School of Medicine for 1977-78 is $12,500.[42] The Association of American Medical Colleges has published the planned tuitions for first-year classes in 1978-79.[43] One--the University of Nevada School of Medical Sciences' tuition for nonresidents of $14,200--is scheduled to be higher than Georgetown's in 1977-78, but only a few of the others are scheduled to be even half as high, and some are very low indeed. For Texas Tech University School of Medicine, the figure is $267. Irrespective of Georgetown's reason for setting tuition so high, the fact that the decision was made at all is a powerful statement about the balance between demand for medical education and the available places. Table 34 confirms the point. For the fall of 1976, 42,155 separate students applied for admission to an American medical school, and only 15,744 of them were offered the opportunity to attend. Of those 15,774 ninety-nine percent--15,613--actually enrolled.[44] Whatever the problems of this sector of American higher education, excess capacity is not one of them.

A final area for examination is training for careers in education. The smaller cohorts have already made their presence felt in the schools, and the job market for teachers has been poor for a number of years. Has the flow of degrees in education reflected this situation? By one definition the total number of degrees in education reached a peak in 1972-73, and by 1974-75 the number was smaller by 15 percent.[45] It appears that this trend will have to continue for

TABLE 34*

Medical School Applicants and First-Year Enrollment
1955-56 through 1976-77

(1) Academic Year of Enrollment	(2) Applicants for (i.e., not during) Specified Year	(3) Accepted Applicants	(4) Ratio (2) ÷ (3)	(5) First-Year Enrollment
1955-56	14,937	7,969	1.9	7,686
1956-57	15,917	8,263	1.9	8,014
1957-58	15,791	8,302	1.9	8,030
1958-59	15,170	8,366	1.8	8,128
1959-60	14,992	8,512	1.8	8,173
1960-61	14,397	8,550	1.7	8,298
1961-62	14,381	8,682	1.7	8,483
1962-63	15,847	8,959	1.8	8,642
1963-64	17,668	9,063	1.9	8,772
1964-65	19,168	9,043	2.1	8,656
1965-66	18,703	9,012	2.1	8,759
1966-67	18,250	9,123	2.0	8,964
1967-68	18,724	9,702	1.9	9,479
1968-69	21,117	10,092	2.1	9,863
1969-70	24,465	10,514	2.3	10,401
1970-71	24,987	11,500	2.2	11,348
1971-72	29,172	12,335	2.4	12,361
1972-73	37,000	13,500	2.7	13,570
1973-74	40,506	14,335	2.8	14,185
1974-75	42,624	15,066	2.8	14,963
1975-76	42,303	15,365	2.8	15,351
1976-77	42,155	15,774	2.7	15,613

*Association of American Medical Colleges, *Medical Education: Institutions, Characteristics and Programs*, p. 23.

some time before a rough balance between jobs and would-be teachers is reestablished. While it is continuing, those institutions for which the training of teachers has been a major activity will be in special difficulties.

Although the number of bachelor's degrees in education has been declining, the number of master's degrees has continued to increase; the data indicate that 14 percent more were awarded in 1974-75 than in 1972-73. Possibly the signals of the market-place are being ignored, but what seems more likely is that they are being heeded in the following way. Faced with a competitive job market and a graduate degree that is relatively economical to obtain, many who want careers in education may be seeking to improve their standing in the labor market by augmenting their professional credentials.

The data which appear in Table 35 on degrees in elementary education are of particular interest. They are less subject to problems of definition than are total degrees in education, and the unfavorable demography has had more time to influence elementary than secondary education. Bachelor's degrees reached a peak in 1971-72; by 1974-75, 26 percent fewer were awarded. Again, while the number of bachelor's degrees has been declining, the number of master's degrees has continued to increase. A final point of some interest is the different pattern for men and women. There is a decline for both beginning in the early part of the 1970s, but it has been much more pronounced for the women. Indeed the position of men here is reminiscent of the position of women in the market for Ph.D.s. In both cases the small absolute numbers may confer a degree of scarcity which is at least a partial shield from the forces that are operating in the aggregate.

TABLE 35*

Earned Bachelor's and Master's Degrees
in Elementary Education,
1968-69 through 1974-75

Year	Bachelor's Degrees			Master's Degrees
	Total	Men	Women	
1968-69	85,589	7,548	78,041	13,334
1969-70	89,887	7,880	82,007	16,081
1970-71	90,960	8,238	82,722	17,079
1971-72	93,664	8,900	84,764	19,576
1972-73	90,067	9,351	80,536	21,134
1973-74	81,041	9,745	71,296	22,032
1974-75	69,598	8,641	60,957	22,076

*Charles Andersen (editor), A Fact Book on Higher Education: Fourth Issue/1976, p. 76.283

In sum, there is ample evidence that the demand for higher education tends to rise and fall in fairly regular ways in response to opportunities in the job market. These dynamics are of the greatest importance in assessing the demand for graduate education, but they play an important role for substantial portions of undergraduate education, too.

5. The Outlook by Type of Institution

To the extent possible, it is worthwhile to consider the outlook for enrollment not only by disciplines and degree levels but also by types of institution. The Carnegie Foundation for the Advancement of Teaching has explored this subject in some detail.[46] The result is not a specific quantitative forecast but rather a broad discussion of relevant factors and possible outcomes. The general sense which emerges is that some categories of institutions are in for more difficulty than others. Universities, the more highly selective liberal arts colleges, and public two-year colleges appear to face bearable futures. By contrast, comprehensive universities and colleges--especially the private ones--the less highly selective liberal arts colleges, and private two-year colleges face bleaker prospects. Of course these are generalizations for whole categories; regardless of its category, any one institution can have a great deal of control over its own destiny.

6. Academic Ability and Financial Background: The Work of Humphrey Doermann

One further and final category of information bearing on the future prospects for enrollment warrants discussion. It is the work of Humphrey Doermann, and its special contribution is to examine the interrelations between measured academic ability and financial background of high school graduates.[47]

Table 36 reproduces much of the information Doermann has derived for 1976.[48] The number in each cell is an estimate of how the 3,175,000 high school graduates would be distributed if all had taken the verbal portion of the College Entrance Examination Board's Scholastic Aptitude Test (SAT).

TABLE 36*

Estimated Distribution of All High School Graduates by Verbal Aptitude and Family Income, 1976

(Numbers of students in thousands)

SAT verbal score		200-249	250-299	300-349	350-399	400-449	450-499	500-549	550-599	600-649	650-800
SAT percentile (Cutoff) level for lowest score)		0	15	29	45	60	74	84	91	96	99
Family income											
percentile	Amount										
0- 20	under $8,680	165	127	117	89	65	36	19	11	4	1
20- 40	$ 8,680-14,099	117	106	112	100	84	53	32	19	10	2
40- 60	$14,100-19,099	89	89	108	101	93	64	43	28	15	4
60- 80	$19,100-25,499	66	73	98	99	100	75	54	39	23	7
80- 90	$25,500-36,099	24	29	43	47	52	42	33	26	17	6
90-100	over $36,100	15	20	30	40	51	47	41	36	26	13
Totals		476	444	508	476	445	317	222	159	95	33

Total number of high school graduates: 3,175

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*Humphrey Doermann, "The Future Market for College Education," in A Role for Marketing in College Admissions, p. 35.

The data support several findings of great interest. The first is simply how small is the pool of high school graduates having high measured verbal ability and coming from families with incomes large enough to make the prospect of paying a large tuition out of current income reasonable. Only 124,000--about 4 percent of the total--were estimated to have scores above 550 and to come from families with incomes over $25,500. Relative to all the admissions officers in all the colleges who were seeking during 1975-76 to fill the next freshman class, that number is not very large.

A second point of interest is the relationship between income and aptitude. For relatively high levels of aptitude, the numbers tend to increase as one reads down a column; for relatively low levels of aptitude, the relationship goes the other way. Measured verbal aptitude and family income are positively associated. Only 10 percent of the families had income over $36,100 in 1976, but 39 percent of young people with verbal aptitudes of 650 or above came from those families. Thus, both in absolute and relative terms, there simply are not many people who do well on the SAT and come from families with modest to low incomes. On the other hand, there are a great many high school graduates with low verbal aptitude and low family income. These relationships are of particular importance in relation to the possibility of counteracting declining enrollments by increasing financial aid.

C. Summary

Some of what lies ahead appears to be quite clear, and much remains uncertain. The size of the traditional college-age population will soon begin to shrink. Higher rates of participation in both the traditional age range and among those who are older may compensate to some extent, but there is at least a distinct possibility that during the 1980s aggregate enrollment in higher education will decrease. As much as anything else, the amount and distribution of financial aid will have a sizeable impact upon the course of events. This point is, itself, an appropriate link to the section on finance which follows.

V. FINANCE

A. Introduction

It would be rare to hear a college or university president speak complacently about the state of the institution's finances. There are good reasons why, predominantly, he or she talks about the problems. For one thing, there is generally the sense that more good things remain to be done: reducing the size of classes, raising the pay of faculty and staff, initiating new programs of education and research, accumulating more material for the library, offering more financial aid. This brief and general list could become long and detailed before including an item that would not be widely regarded as a very good thing to do if only the money were available. In this sense, money is always in short supply.

There are features of the financial arrangements themselves which help to insure that, typically, the institution's finances will be seen as troubled rather than trouble-free. First, since these institutions, almost without exception, are not profit-making, they lack the financial cushion which profit typically provides. Such a cushion would help make it possible for an unexpected increase in cost or reduction in revenue to be received on something approximating a business-as-usual basis. In the absence of such a cushion, unpleasant financial news tends to be received, sometimes quite realistically, as a crisis.

Second, a change in enrollment -- no matter whether it is an increase or a decrease -- is not ordinarily self-financing. The only change in enrollment that is typically self-financing is an increase which is a step towards eliminating excess capacity. All other changes produce unfavorable financial consequences. If enrollment decreases, revenue shrinks faster than cost, and if enrollment increases in the absence of excess capacity, the total amount of operating revenue needed from other sources will be greater after the expansion than before it. Thus a booming demand has different consequences for education than for, say, automobiles. The automobile manufacturer will simply make more money, but an educational institution will find it necessary, when it collects more tuition, to obtain correspondingly more from other sources, too.

For these reasons it is not easy to distinguish between when the educational sector is having its usual difficulties and when there is a more profound state of financial crisis. This difficulty led the National Commission on the Financing of Postsecondary Education to observe, "Perhaps the only unequivocal proof of financial distress among educational institutions is their actual demise."[1] The point is that these things are matters of degree. It is in the nature of American higher education that there will always be institutions in jeopardy, just as there are always small businesses in jeopardy. Despite all this, there is evidence that the current situation is more than troubles-as-usual and that unless government somehow increases its subsidy to the sector, a relatively large number of institutions will disappear. Without being any more definite than is warranted, the Carnegie Foundation for the Advancement of Teaching said there were "indications" that as many as 10 percent of the institutions might not survive beyond the early 1980s.[2] But, of course, what in fact will happen is unclear. In previous crises institutions have shown new resourcefulness and survived. No doubt there will be some victories of this sort in the period ahead -- and probably some near misses too -- and the victories will not come easily.

B. The New Depression and Efforts to Economize: Aspects of Cost

The current difficulties started long before the prospect of declining enrollments was widely recognized. In an important sense, financial difficulties began in the 1960s when enrollments were growing rapidly, and their impact was not only on the less sturdy. As early as 1963 Yale had what was described in Time magazine as "its first seriously unbalanced budget in history."[3] The central problem in this period has been the persistent tendency for operating costs per student to grow faster than current income per student. Since most institutions simply cannot finance deficits for very long, there is a perpetual struggle to keep the rates of growth of operating cost and current income per student in tandem.

What has been behind the pressure for operating cost per student to increase? The ever-present inventory of new ideas which someone wants to try is part of the answer. Perhaps it played an unusually large role in the 1960s when educational institutions responded to a wide spectrum of pressures to address an ever-expanding agenda.

An additional factor in the 1960s was the rapid expansion of enrollment and the consequent brisk rise in demand for faculty which led to rapidly rising salaries. A special feature of this demand was the competition between the public and private sectors especially for outstanding scholars and scientists. Private institutions found themselves bidding against public institutions in an atmosphere in which state legislators were enthusiastically promoting and supporting their universities. Franklin Ford, then Dean of the Faculty of Arts and Sciences at Harvard, commented: "The senior faculty members expect a review of their salaries every year. No one seems to remember back in the '30s when it was every four or five years."[4]

A basic factor in the rising per student costs, one unrelated to the particular facts of the 1960s, arises from fundamental features of our modern economy. Education is essentially a handicraft industry in which costs tend to rise faster than in the large-scale, heavily capitalized sectors in which technological change and new investment permit output per worker to grow regularly and substantially. In a modern economy, those sectors in which productivity grows relatively slowly, of which education is certainly one, will typically find themselves in an unfavorable position.[5]

Concretely, William Bowen, in an analysis of the accounts of the composite university Chicago-Vanderbilt-Princeton, found that per student costs for roughly the two decades following World War II rose 7.5 percent annually.[6] This result seems to have broader applicability for the period in question and has come to be known as "Bowen's Law." Some of Earl Cheit's findings coincide with "Bowen's Law." Cheit, one of the early and influential students of the economics of American higher education in the 1970s, did an original study and then later a follow-up of forty-one institutions, and from its title, came the phrase which has been widely used to characterize the problems of the '70s -- "the new depression in higher education."[7] In the original study, Cheit placed institutions in one of three categories: "not in trouble," "headed for trouble," and "in financial difficulty." During the 1960s, per student expenditure for instruction and departmental research rose annually as follows: 7.3 percent for schools not in trouble, 7.7 percent in those headed for trouble, and 8.0 for those in financial difficulty.[8] Commenting on these results, Cheit wrote: "Although this group of institutions was not 'representative' of the nation as a whole, it is remarkable how closely the experience of our institutions approximates that predicted by Bowen's Law."[9]

Three other studies of interest compare growth in educational costs with growth in the consumer price index (CPI). As reported by Cheit, June O'Neill's data show that between 1929-30 and 1959-60 costs per credit hour rose annually by 2.5 percentage points more than did the CPI.[10] The Carnegie Commission, based upon costs of instruction, departmental research, student services, libraries, and a few other items, concluded that during the 1960s, the average annual cost per FTE student in all of higher education grew by 3.3 percentage points more than the CPI.[11] Cheit reports that, for the institutions he himself studied, expenditure per student for the period 1966-67 through 1969-70 rose at an annual rate of 8.1 percent which was 3.9 percentage points in excess of the rate at which the CPI grew during those years.[12]

These results all predate the escalating difficulties of the 1970s, and therefore it is especially interesting to set them side by side with data for the 1970s. For the forty-one institutions Cheit studied, average per student expenditure increased at an annual rate of 5 percent from 1969-70 to 1972-73, just 0.5 percent above the 4.5 percent average annual rate of growth of the CPI during the period. For seventeen of the institutions expenditure per student grew more slowly than the CPI; thus real expenditure declined. And three were actually spending fewer current dollars per student at period's end than initially.[13]

Lyle H. Lanier and Charles J. Andersen surveyed 360 institutions later in the decade and reported their results by Carnegie category.[14] Some of their findings appear in Table 37.[15] Their figures show a widespread decline in real per student expenditure between 1973-74 and 1974-75; every percentage in columns 4 and 8 is negative. With one exception, declines in the private sector exceeded those in the public sector wherever the comparison is possible. The decline in per student expenditure was especially striking for category 1.2; the aggregate decline over the period was about 12 percent in constant dollars. The exceptional increase in real expenditure in private two-year colleges is hard to interpret. It may be due largely to the median decline of FTE enrollment in these institutions of 3.8 percent over the period.[16] Per student expenditure will surely increase if, at the last minute, enrollment turns out to be lower than planned.

TABLE 37*

Median Percentage Change in Educational-and-General Expenditures per FTE Student by Type and Control of Institution, in Current and Constant (1963-64) Dollars

	Type of Institution	Private Institutions				Public Institutions			
		Current Dollars		Constant Dollars		Current Dollars		Constant Dollars	
		1972-73 to 1973-74 (1)	1973-74 to 1974-75 (2)	1972-73 to 1973-74 (3)	1973-74 to 1974-75 (4)	1972-73 to 1973-74 (5)	1973-74 to 1974-75 (6)	1972-73 to 1973-74 (7)	1973-74 to 1974-75 (8)
1.1	Research Universities I	4.7%	5.8%	-2.0%	-3.8%	5.9%	5.9%	-0.9%	-3.7%
1.2	Research Universities II	1.7	1.5	-4.8	-7.7	7.8	5.9	0.9	-3.5
1.3	Doctoral-Granting Universities I	5.1	4.2	-1.7	-5.3	10.3	8.6	3.2	-1.3
1.4	Doctoral-Granting Universities II	10.6	4.0	3.5	-5.5	8.1	5.8	1.2	-3.8
2.1	Comprehensive Universities and Colleges I	6.3	4.8	-0.5	-4.8	9.4	8.8	2.4	-1.0
2.2	Comprehensive Universities and Colleges II	9.2	7.8	2.2	-2.0	10.2	4.6	3.2	-5.0
3.1	Liberal Arts Colleges I	6.0	5.5	-0.8	-4.1	NA**	NA	NA	NA
3.2	Liberal Arts Colleges II	7.8	4.8	0.8	-4.6	NA	NA	NA	NA
4.	Two-Year Colleges & Institutes	15.6	3.8	8.1	-5.6	3.4	8.6	-3.2	-1.4

*Lanier and Andersen, A Study of the Financial Condition..., p.52.

**NA means not available.

What accounts for the change around the late 1960s from rising to falling real expenditures per student? The answer is that events mandated other patterns. Deficits in the current budget become more and more prevalent, and out of necessity, institutions began to economize. The old path for expenditures per student of the CPI plus 2.5 percent was simply no longer feasible. In his original study, published in 1971 and focusing on the preceding few years, Cheit found that efforts to economize were in a "tentative, marginal, or beginning state -- ranging from belt-tightening to worrying."[17] In the follow-up study he found that by the early 1970s, "cost control has escalated to an extraordinary degree."[18]

Where does a college or university economize? A popular first area is maintenance, but, except for the relatively short run, there are certain limits to what can be done, and short run economies have a way of leading to more spending later. A second area chosen frequently for economizing is faculty salaries. Faculty salaries are a large proportion of total expenditure, and tenure, although it has not always protected jobs, substantially constrains the institution's opportunity to respond to stringency by reducing the size of the faculty. Institutions do, however, have substantial latitude in determining the rate of growth of faculty salaries. Table 38 indicates what the course of average faculty salaries has been since 1969-70. The worst year was 1974-75 because the rate of inflation was so high; the consumer price index rose 10.5 percent. On the average, real incomes of academics have been declining since 1972-73.

TABLE 38*

Annual Percentage Changes in Average Compensation, Monetary and Real, for Institutions Reporting Comparable Data, From 1969-70 to 1976-77

Academic Rank	1975-76 to 1976-77	1974-75 to 1975-76	1973-74 to 1974-75	1972-73 to 1973-74	1971-72 to 1972-73	1970-71 to 1971-72	1969-70 to 1970-71
	Increase in Monetary Compensation (percent)						
Professor	5.5	6.6	6.5	5.9	5.0	4.0	5.8
Associate	5.5	6.4	6.6	6.0	5.0	4.0	6.2
Assistant	5.4	6.2	6.3	5.7	5.0	4.3	6.3
Instructor	5.4	6.5	6.1	5.7	5.0	5.3	6.6
All Ranks	5.5	6.4	6.4	5.9	5.0	4.3	6.2
	Increase in Real Terms: Monetary Compensation Deflated by the CPI (percent)						
Professor	-0.3	-0.5	-4.1	-1.5	0.2	0.2	0.7
Associate	-0.3	-0.7	-4.1	-1.4	0.2	0.2	1.0
Assistant	-0.4	-0.8	-4.3	-1.7	0.2	0.5	1.1
Instructor	-0.4	-0.5	-4.5	-1.7	0.2	1.4	1.4
All Ranks	-0.3	-0.7	-4.2	-1.5	0.2	0.5	1.0

*Maryse Eymonerie and Robert Dorfman, "No Progress This Year: Report on the Economic Status of the Profession, 1976-1977," AAUP Bulletin, Vol. 63 (August, 1977), p. 155.

1965 and 1975. During this period, the share of enrollment in the public sector increased rapidly. In general, student-faculty ratios are higher in the public sector, and thus the observed increase is, to a large extent, a consequence of the changing relative shares of the two sectors.

TABLE 39*

Ratios of FTE Enrollment, All Students, to FTE Instructional Staff, Selected Years, 1959-1975

1959	13.3	1966	14.4	1971	15.3
1960	14.6	1967	14.5	1972	15.9
1961	15.0	1968	14.5	1973	16.1
1963	15.3	1969	14.7	1974	16.3
1965	14.8	1970	14.9	1975	16.5

*Charles Andersen (editor), *A Fact Book on Higher Education: Third Issue/1976*, p. 76.155.

TABLE 40*

Ratio of All Students to Faculty and Professional Staff on a Headcount Basis, by Sector, 1972-73 and 1975-76

	Public Sector			Private Sector		
	(1)	(2)	(3)	(4)	(5)	(6)
	Students	Faculty and Professional Staff	(1) ÷ (2)	Students	Faculty and Professional Staff	(4) ÷ (5)
1972-73	7,122,875	622,194	11.4	2,174,912	264,971	8.2
1975-76	8,896,021	725,000	12.2	2,394,698	275,000	8.7

*Charles Andersen (editor), *A Fact Book on Higher Education: Second Issue/1976*, p. 76.81.

Charles Andersen(editor), *A Fact Book on Higher Education: Third Issue/1976*, p. 76.151.

Table 40 shows in a crude way how the ratios have been changing in the two sectors.[22] Over the period the ratio grew by approximately the same percentage in each sector and remained about 40 percent larger for the public sector. Table 41 makes the same comparison for degree-credit students only. Although the ratio grew in both sectors, it grew faster in the private sector. On this basis, the ratio was larger in the public sector by 23 percent in 1972-73 and by only 18 percent in 1975-76. The thrust of all of this information is that during a difficult financial period, a generalized student-faculty ratio has been growing in both sectors and, on one basis, growing somewhat faster in the private sector.

In short, when faced with unsustainably large and widening gaps between cost and income and great difficulties in increasing revenues, institutions took steps to economize where they could. Cheit found that maintenance of plant and faculty salaries bore a large portion of the burden of economizing. Student-faculty ratios increased somewhat as well.

TABLE 41*

Ratio of Degree-Credit Students to Faculty and Professional Staff on a Headcount Basis, by Sector, 1972-73 and 1975-76

	Public Sector			Private Sector		
	(1) Students	(2) Faculty and Professional Staff	(3) (1) ÷ (2)	(4) Students	(5) Faculty and Professional Staff	(6) (4) ÷ (5)
1972-73	6,207,134	622,194	10.0	2,134,785	264,971	8.1
1975-76	7,440,000	725,000	10.3	2,390,000	275,000	8.7

*Charles Andersen (editor), A Fact Book on Higher Education: Second Issue/1976, p. 76.81.

Charles Andersen (editor), A Fact Book on Higher Education: Third Issue/1976, p. 76.151.

What general conclusions emerge regarding these efforts to economize? In early 1973, Cheit's assessment was:

> The main finding from this look, two years later, at the 41 institutions is that most seem to have achieved a tentatively stabilized financial situation. That stability is fragile, for it is the product of unusual cuts in expenditure growth and is based in part on favorable assumptions about external conditions - inflation, enrollments, private support, and public policy at the state and federal levels. Clearly, then, it would not take much to destroy the stability and force the institutions on a downward course again.[23]

Two years later, Lanier and Andersen add their own note of pessimism by concluding:

> The overriding conclusion from the present study and earlier evidence is that progressive deterioration has been occurring in the financial condition of higher education as a whole in recent years. Furthermore, the process of decline appears to have accelerated during the past three years under the joint influence of inflation and recession in the national economy.[24]

C. A Special Factor Related to Cost; The Age Distribution of the Faculty

Before we turn to revenue, there is one more important topic relating to cost which deserves some attention: the age distribution of the faculty. Compensation for the faculty is obviously a major element of cost, and the size of this bill depends heavily upon the age distribution of the faculty. Between now and 1990 the average age of the national faculty is expected to rise markedly. This trend will in time tend to increase the wage bill and therefore the per student cost of instruction.

Forecasting the age distribution of the faculty involves a great many factors: the student-faculty ratio, age of retirement, the rate of leaving the academy before retirement, the level of academic salaries are but a few. Different assumptions lead to different results. Table 42 presents the actual distribution in 1972 and two forecasts of the distribution in 1990, one by the Carnegie Commission and one derived from Alan Cartter's work.[25] Both forecasts suggest that a major change is on the horizon; the anticipated change is somewhat larger in the Carnegie Commission's format. In 1972, 42 percent of the faculty were forty or younger. Looking to 1990, Cartter's format makes this percentage twenty-nine, and the Carnegie Commission's makes it thirteen. Whichever forecast proves more accurate, academic administrators will find the realities of the wage bills implied by these distributions harsh.

TABLE 42*

Age Distribution of Faculty,
Actual for 1972, Forecasts for 1990
(percent)

(1) Age Group	(2) Actual 1972	Forecasts for 1990 (3) Carnegie Commission	(4) Derived from Cartter's Series
30 and under	7.2	1.0	6.1
31-35	17.8	2.8	10.5
36-40	17.1	8.7	12.5
41-45	16.3	18.8	14.6
46-50	14.0	24.5	15.6
51-55	11.7	21.2	14.9
56-60	8.3	14.2	13.2
61-65	5.6	8.8	8.7
over 65	2.0		3.9

*Cartter, Ph.D.'s..., pp. 173 and 182.

The Carnegie Commission on Higher Education, Priorities for Action: Final Report of the Carnegie Commission on Higher Education (New York and other cities: McGraw-Hill Book Company, 1973), p. 119.

D. Revenue

1. The Revenue Accounts and Their Relation to Financial Aid and Excess Capacity

Response to financial difficulties involves consideration of revenue as well as cost. Had revenue been available in sufficient quantity, it seems unlikely that there ever would have been large-scale efforts to economize in response to the gathering tendency for cost to grow faster than revenue. Therefore it is important to our understanding to consider the sources of revenue.

Before we turn to the actual accounts, there are a few preliminaries. Two broad revenue totals are used most frequently:

educational and general income and current-fund income. The former is the more narrowly defined; current-fund income is the broader concept. For 1975-76, aggregate current-fund income was in the neighborhood of $40 billion. It includes the educational and general income plus some other items, e.g. income from auxiliary enterprises such as dormitories, dining halls, and hospitals. It also includes funds earmarked for financial aid that come directly to the institution. Until 1974-75 these revenues appeared separately, but one of the changes that took place with the preparation of the data for 1974-75 was to incorporate them in other series. "Student aid income" is no longer reported as a separate series.

From the usual presentation of institutions' accounts, understanding the significance of financial aid is not easy. Consider an example. Suppose money to support one scholarship flows from the state to an institution, is distributed to the scholarship recipient, who then returns it to the institution in payment of tuition. The current-fund revenue account will show receipts of an amount equal to two tuitions even though an amount equal to only one tuition actually flowed, net, into the system. Of course, the accounting is perfectly proper: the student-aid expenditure account shows an expenditure equal in value to one tuition, but the reported revenue overstates the institution's net cash receipts. The true net cash receipts are obtained by putting the tuition receipts on a net rather than a gross basis; net tuition receipts are gross receipts minus financial aid expenditures.

In the context of excess capacity, understanding the special features of the accounting for financial aid becomes crucial. The conventional method of accounting can make financial aid expenditures appear as if they are making things worse when in fact they are helping to make things better in the short run.

Again, an example can help. Suppose an institution has a tuition of $3,000 and excess capacity. Suppose, too, it estimates that the cost associated with having an extra student is $500. This amount is less than the average cost for the students already there, but after all, the faculty has to be paid and the buildings heated whether or not the extra student comes. Perhaps he will use some equipment in the chemistry laboratory that would not have been used otherwise and add to the institution's overall cost in a few other ways, but in general, his presence will add little to cost.

Since the institution has excess capacity, the Director of Admissions and Financial Aid may decide that reducing the price would help to increase enrollment. What happens to the institution's financial situation if an extra student is admitted and offered a scholarship of $1,800 which is not supported by the income from any special fund or agency? The current-fund income will show an increase of $3,000, and the current-fund expenditure will show an increase of $2,300 -- $1,800 for financial aid and $500 as the real costs associated with the extra student. Whatever the institution's measured deficit would have been without the extra student, his admission has reduced it by $700. The student has really paid $1,200, and the institution has really incurred additional costs of $500.

The problem is that for those who are unfamiliar with the idiosyncracies of educational accounting, it is easy to look at the accounts and draw just the opposite conclusion. In the context of excess capacity, there will most likely be a deficit as well. In looking at the accounts the uninitiated observer might well think something like, "There's a deficit. How to eliminate it? Cut some element of expenditure. Financial aid is a large element of expenditure. Cutting it, therefore, will make things better in the short run." Right? Wrong.

The phrase "in the short run" is, of course, crucial. In the long run reducing financial aid may help, but the problem in the first place was excess capacity. Awarding financial aid above and beyond what might have been awarded if the institution had faced excess demand is, in the opposite circumstance, only a second best strategy to reduce the immediate level of the deficit, presumably while efforts are made to increase the size of the applicant pool for the long run.

This discussion seems especially timely because excess capacity is now widespread and seems destined to become more so. W. John Minter and Howard Bowen have provided some important information on this subject.[26] Some of their results are given in Table 43. Sixty-one of the one hundred institutions surveyed indicated a wish to enroll more students in 1976-77; only sixteen indicated no such wish. There was excess capacity in each category of institution listed. For those institutions indicating any excess capacity

TABLE 43*

Information on Excess Capacity from Minter and Bowen's Study, by Certain Carnegie Categories, 1976-77

Institutions were asked: "Would you have preferred to enroll additional students?	Distribution of Responses was:				For those reporting preference for more students, percentage increase in enrollment that could have been accommodated without significant additions to faculty, housing, classrooms
Carnegie Category	Yes	No	No Answer	No. of Institutions	
1. Doctoral-Granting Universities:	7	0	3	10	5
2. Comprehensive Universities and Colleges:	19	4	9	32	7
3.1 Liberal Arts Colleges I:	11	11	2	24	13
3.2 Liberal Arts Colleges II:	25	0	9	34	13
All	61	16	23	100	NA

*Minter and Bowen, Private Higher Education: Third Annual Report on Financial and Educational Trends in the Private Sector of American Higher Education, p. 15.

at all, the relative amount was greatest among the liberal arts colleges. Those liberal arts colleges wishing to increase enrollment had room, on the average, for 13 percent more students without incurring significant additions to faculty, housing, or classrooms.

2. The Amount of Revenue for Types of Institutions

Excess capacity will surely call into play efforts to generate more revenue. But what is already known about the current flow of revenues to institutions of higher education? Table 44 presents Lanier and Andersen's finding for educational and general revenue per FTE student in 1974-75 with institutions classified by Carnegie category and by type of control. The most striking contrast is that between the major private research universities and all other institutions, especially the major public research universities. One reason for the difference is that in recent decades undergraduate enrollments in the major private research universities have expanded very little while enrollment in much of American higher education -- especially in the public sector -- has been expanding rapidly. More broadly, per student revenue is greater in the private than in the public sector in every instance for which there are data. For categories 2 and 4, however, the equally interesting result is how small the advantage of the private sector is.

TABLE 44*

Median Educational and General Revenues per FTE Student,
by Selected Carnegie Category and Control,
Current Dollars, 1974-75

	Carnegie Category (1)	1974-74 Private (2)	 Public (3)
1.1	Research Universities I	$12,688	$5,689
1.2	Research Universities II	6,165	4,220
1.3	Doctoral-Granting Universities I	4,912	3,433
1.4	Doctoral-Granting Universities II	3,493	2,462
2.1	Comprehensive Universities & Colleges I	2,561	2,411
2.2	Comprehensive Universities & Colleges II	2,680	2,432
3.1	Liberal Arts Colleges I	3,724	NA
3.2	Liberal Arts Colleges II	2,837	NA
4.	Two-Year Colleges and Institutes	2,175	1,915

*Lanier and Andersen, A Study of the Financial Condition..., p. 21.

3. The Sources of Revenue: General Considerations

Where does the money come from? Table 45 shows the various categories of current-fund revenue for all institutions of higher education and by sector for 1974-75; the data are in both dollars and relative shares for each category. Unfortunately, more recent data are not readily available, but there is reason to believe that the percentages have not been changing much recently although the dollar totals have continued to grow.

The figure of $5.9 billion reported as receipts from the federal government is only part of the money which makes its way from the federal government to institutions of higher education.

Some of this money is distributed initially to students and comes to the institutions either as tuition and fee income or as the income of auxiliary enterprises. In addition, some of the money which the federal government spends "for higher education" never reaches the institutions at all but purchases such things as room and board for students who are living and eating off-campus. Thus, there is a large difference between federal spending for higher education, as conventionally defined, and the institutions' receipts identified as coming from the federal government, as they are conventionally defined.[27]

TABLE 45*

Current Fund Income, by Major Source,
Public and Private Sectors, 1974-75
(in billions of dollars and as percent of total)

Source of Income	Public Sector		Private Sector		All Institutions	
	Amount	Percent	Amount	Percent	Amount	Percent
Tuition and Fees	$ 3.1	12.8 %	$ 4.2	35.8 %	$ 7.3	20.3 %
All Government	15.8	65.4	2.5	21.6	18.3	51.1
Federal	3.7	15.5	2.2	18.7	5.9	16.5
State	10.7	44.3	.2	2.1	10.9	30.6
Local	1.3	5.6	.1	.7	1.4	4.0
Endowment Earnings	.1	.6	.6	5.2	.7	2.0
Private Gifts and Grants	.6	2.3	1.2	10.1	1.8	4.9
Auxiliary Enterprises	2.6	10.5	1.5	13.1	4.1	11.4
All Other	2.1	8.4	1.7	14.2	3.8	10.4
TOTALS	$24.2	100.0 %	$11.7	100.0 %	$35.9	100.1 %**

*Charles Andersen (editor), *A Fact Book on Higher Education: First Issue/1976*, p. 76.61.

**Adds to more than 100% due to rounding.

4. Institutions' Reliance on Government and Tuition as Sources of Revenue

The public and private sectors rely in quite different degrees upon government, on the one hand, and tuition and fees, on the other. Over three-fifths of the public sector's money came explicitly from state, federal, and local government; for the private sector the figure was roughly one-fifth. The public sector obtained only about one-eighth of its support from tuition and fees; by contrast, the private sector as a whole obtained over one-third of its current-fund revenue in this way.[28] The absolute numbers provide additional perspective. Total gross tuition was larger in the private than in the public sector, $4.2 billion in the former and $3.1 billion in the latter. To be sure, the actual fees paid by students and their families, net of all financial aid, might not show such a discrepancy, but even the comparison of these gross figures is noteworthy when we remember that roughly 80 percent of the students are in the public sector.

Table 46 tells more about the reliance of various institutions upon tuition; it gives the share of revenues accounted for by tuition by type of control within Carnegie categories.[29] The numbers make clear the heavy reliance upon tuition in the private sector for all but one of the Carnegie categories. Apart from the research universities, the median share of gross tuition in educational and general revenue was over half in each of the other categories. Even for Research Universities II, it was nearly half. For Comprehensive Universities and Colleges it was nearly 85 percent, and since that figure is a median, for some institutions it was even higher.

TABLE 46*

Median Tuition-and-Fee Revenues as Percentage
of Educational-and-General Revenues per FTE Student,
by Carnegie Categories, 1974-75

Carnegie Category (1)		1974-75 Private (2)	1974-75 Public (3)
1.1	Research Universities I	23.5 %	13.1%
1.2	Research Universities II	45.9	16.3
1.3	Doctoral-Granting Universities I	55.4	21.0
1.4	Doctoral-Granting Universities II	62.0	24.6
2.1	Comprehensive Universities & Colleges I	84.1	20.6
2.2	Comprehensive Universities & Colleges II	72.9	26.6
3.1	Liberal Arts Colleges I	69.7	NA
3.2	Liberal Arts Colleges II	68.3	NA
4.	Two-Year Colleges & Institutes	67.9	14.7

*Lanier and Andersen, A Study of the Financial Condition..., p. 29.

Table 46 also shows that within each Carnegie category there is a sharp difference between the degree to which public and private institutions rely upon tuition. This difference goes to the heart of the general problem confronting private education. It means that tuitions are relatively high at private institutions and relatively low at comparable public institutions.[30] Public institutions have not been immune to pressures for rising tuition, but in recent years tuition has grown even faster in the private sector so that the gap between full tuition in the two sectors has increased. Benezet provides a sense of the magnitudes involved:

> The widening gap between public and private college tuition has been reported by national studies over the last three decades. In 1973 the Carnegie Commission stated that in the previous

> year private tuition charges had averaged 4.9 times that of the private sector. The gap has widened since then, but it is the absolute dollar gap that is most detrimental. In the current academic year [1975-76] in California the average tuition charge reported by 20 independent colleges is $2465 more than the average for four-year public institutions - a ratio of 7 to 1.[31]

For most of the private sector, the need to charge higher tuition is an enormous handicap in the competition with the public sector for students. For example, the New Jersey Commission on Financing Post-secondary Education found that "if the price of education were not a factor, New Jersey's young people would select private institutions over state colleges in overwhelming numbers."[32] In a growing market, the problems of the private sector were not so severe, but now, in a shrinking market, many institutions are in serious jeopardy.

The problems of the private institutions in obtaining revenue can be seen in the following way. On the one extreme, they can keep tuition low and maintain their clientele, though there will be a tendency for deficits to appear simply because there is too little revenue from tuition. On the other extreme, they may raise tuition to a level which would produce a balanced budget if the institution were full. This level, however, is likely to prompt many students to choose the public institutions, thus leaving the private institutions with excess capacity and, consequently, deficits again. The middle way between these extremes is to raise tuition and offer generous amounts of financial aid. This strategy is now widely employed. This course, in turn, leads to the notion of "unfunded" student aid. As the earlier discussion showed, the question of whether there is a "funded" scholarship is beside the point in the short run. If an institution with excess capacity knows that, by admitting a student, it will incur costs of $500, then it would be prudent to try to enroll students, up to the limit of full capacity, who qualify for admission and who will pay at least $500. The fact that, with tuition at $3,000, these students will have scholarships of up to $2,500 is irrelevant.

One way or another, the private sector's difficulties will in the long run be resolved. Either there will be some forces expanding demand, or there will be a contraction in the number of private institutions. Exactly what happens will depend on the outcome of a broader debate that has been going on for a long time but which seems certain to have a special role in the near future. In its most general form the debate concerns who should obtain higher education and who should pay the bills.

Currently a main feature of the debate centers around the form of the public subsidy to higher education. Virtually all students in all institutions receive some subsidy in the sense that charges typically do not cover costs. However, for comparable institutions, the subsidy is much larger in the public than in the private sector. Moreover there is an additional set of subsidies for some students in the form of financial aid.[33]

What if the general subsidy in the public sector were more nearly what it is in the private sector and the public spending that was avoided in this way became available to finance an expanded level of particular subsidies for those who, by some definition, were in need so that subsidies were redistributed from the children of relatively wealthier to the children of relatively poorer families? What, in short, if tuitions were raised in public education and the level of financial aid were simultaneously expanded?

One variant or another of this proposal has regularly been offered in recent years. The Committee for Economic Development (CED) has provided one, and so has the Carnegie Commission. Howard Bowen characterized them both -- as well as others which he was reviewing -- as "moderate," but the CED's goes further.[34] The recommendation, which was published in 1973, was that within ten years for the two-year colleges and five years for all other institutions, tuitions rise "until they approximate fifty percent of institutional costs (defined to include a reasonable allowance for replacement of facilities)...."[35] The Carnegie Commission made a more modest -- and also more detailed -- proposal. It provided for tuition to vary across the several divisions within colleges and universities, in relation to costs of instruction, more than it does at present.[36] The main recommendation was that tuition in public institutions should rise over ten years to about one-third of educational costs except that the public two-year colleges were to be exempted altogether. The Commission favored "low, or preferably no tuition for them."[37] Both the CED and the Carnegie Commission favored expanded financial aid with particular emphasis on improved opportunities for students to borrow.

These proposals are far from commanding universal endorsement. For example, the American Association of State Colleges and Universities has written in a pamphlet:

> For over 150 years, the American people have accepted the principle that tuition should be kept as low as possible at public institutions....
>
> Yet today, Americans seeking a college education are in real trouble. More high school students are graduating each year, but fewer of them are going on to any college.
>
> The most important single reason for this decline in higher educational opportunity since about 1968 is student charges. Hard-pressed governors and state legislators have raised tuition and other charges as a way of balancing state budgets, sometimes with the mistaken belief that "there is enough student aid to take care of anyone who wants to go to college," or that "fewer people want to go, anyway."...
>
> This pamphlet brings together data from many governmental and non-governmental sources to make the overwhelming case that many people now are kept out of college because of student charges, especially tuition; and that a major effort is needed to help reverse the trend toward higher student charges and lower enrollment rates. America's third century holds serious challenges and great promise. It is no time for Americans to turn their backs on over 150 years of progress toward universal opportunity for education beyond the high school level. 38

Such reasoning is not confined to the American Association of State Colleges and Universities. Howard Bowen, although he found the recommendations of the CED and the Carnegie Commission "moderate," still expressed concern to the extent that raising tuition involves large use of means tests and loans:

> Another of my values, this time a negative one, is distaste for the means test and for loading heavy indebtedness upon young people. I recognize the importance of grants based on need, and loans, in a balanced system of student aid. It is when large amounts of money are involved that I become apprehensive.
>
> For our society to require its young people to go heavily into debt represents a less than generous attitude toward our youth. Even from the economic point of view, long-term loans make little sense....Still another difficulty with heavy loans is unfairness as between generations. Those of us of the present middle and older generations received our education without heavy indebtedness. We are in effect saying

> to the next generation, "We got ours; now that your turn has come, you can get your education on the cuff."
>
> What I am suggesting is not elimination of all grants based on a means test or of all student loans. I am counselling that we should go slowly in raising tuitions to a level that will demand heavy use of these devices.[39]

5. Financial Aid: The Federal Government and the States

The Education Amendments of 1972 brought financial aid to the forefront of the federal government's bundle of spending for higher education. A decade ago roughly one-third of that bundle was for financial aid, and now the proportion is about two-thirds.[40] In recent years, when total current-fund revenue of all institutions of higher education has been in the neighborhood of $35 to $40 billion, federal spending for financial aid has been in the neighborhood of $8 to $9 billion.[41]

Two general comments on current federal spending for financial aid are worth making. First, it contains a large component that is explicitly directed to increasing access to higher education for young people from relatively poor families. Second, an even larger part of the spending for financial aid comes as a byproduct of other government programs. Of the total federal spending for financial aid in fiscal 1976, $4.6 billion came as veterans benefits and roughly $1 billion came as benefits through the Social Security program.[42] The distinction is important because funds provided by programs with other primary purposes may fluctuate independently of the needs of students and institutions. For example, higher education's receipt of funds distributed originally by the federal government as veterans benefits is expected to be $1.7 billion less in 1977 than in 1976.[43]

Aside from the large sums that come as veterans benefits and as benefits under the Social Security program, the Office of Education administers the major programs that were designed exclusively to provide financial aid. These programs have reached a very large number of students. Tables 47 and 48 provide some basic information about these programs for 1974-75. Roughly 3.2 million separate awards were made, but these include some duplication, and the actual number of students aided was about 1.6 million. The majority of the participants in each of the programs listed attended institutions in the public sector, but the percentages were especially high for recipients of basic and supplemental grants and somewhat lower for those who borrowed. In 1974-75 the BEOGs went exclusively to undergraduates and overwhelmingly to students from families earning under $12,000 or students not supported by their families. Those who borrow, however, show a somewhat different pattern; a much larger proportion of the borrowing is done by those from families with income over $12,000.

Although most of the money designated as aid for students ultimately moves from the government to the various institutions, it is important to distinguish between that which goes from the government directly to students -- student-based aid -- and that which in the first instance is given to the institutions -- institution-based aid. Both the final distribution of aid money between the various institutions which are potentially the recipients of it and, indeed, some of the character of education itself depend to an extent upon the division of the money between student-based and institution-based aid.

TABLE 47*

Some Basic Information on Programs of Financial Aid
Administered by the U.S. Office of Education, 1974-75

Program	No. of Awards	Average Award	Percent of Recipients Attending an Institution in the Public Sector
Basic Educational Opportunity Grant (BEOG)	543,000	$ 620	77.2
Supplemental Educational Opportunity Grant (SEOG)	350,000	540	68.9
State Student Incentive Grant (SSIG)	302,000	600	NA
College Work-Study (CWS)	575,000	560	63.0
National Direct Student Loan (NDSL)	749,000	690	56.7
Guaranteed Student Loan (GSL)	669,000	1,250	56.3

*Frank J. Atelsek and Irene L. Gomberg, Student Assistance: Participants and Programs, 1974-75 (Washington: American Council on Education, 1975), pp. 16 and 25.

What is basically at issue is how much institutions ~~will~~ find it necessary to sell education aggressively in a situation of excess capacity which implies a buyer's market. When the money is in the hands of the students, institutions will be motivated to sell whatever it is they offer. Some institutions are extremely popular and, at least in the short run, need not work very hard at selling, but most institutions -- especially in the private sector --

TABLE 48*

Percentage of Recipients of Aid Having Selected Characteristics, by Program, 1974-75

Characteristics	Total** (Unduplicated Count)	Recipients					
		BEOG	SEOG	SSIG***	CWS	NDSL	GSL
Total Recipients	1,584,000	543,000	350,000	302,000	575,000	749,000	669,000
Status							
Dependent Undergraduates:							
Family Income							
Less than $7,500	33.3	53.5	54.3	34.8	38.5	30.8	13.5
$7,500 - $11,999	24.8	25.3	22.4	27.5	25.9	24.7	18.2
More than $11,999	19.1	7.3	5.3	25.2	17.2	21.4	37.3
Independent Undergraduates	18.0	14.0	18.1	12.5	14.5	17.0	15.6
Graduate Students	4.8	-	-	-	3.9	6.1	15.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Atelsek and Gomberg, Student Assistance..., p. 18.

**The Guaranteed Student Loan Program is not included.

***The SSIG program began operating only in 1974-75. There were some problems in the data and Atelsek and Gomberg indicate that the reported number of SSIG recipients is inflated.

are not so well insulated from the ups and downs of the marketplace. When the institutions receive the money in the first place, the situation is fundamentally different. In that case, they have greater opportunity to select the students they prefer. By contrast, when the money is initially distributed to the students, they have greater opportunity to select the institutions they prefer.

The balance between the funds the federal government made available by these two methods of distribution in fiscal year 1977 is presented in Table 49. The NDSL, CWS, and SEOG are the institution-based programs, and each predates the 1970s. The major student-based program of the U.S. Office of Education is the BEOG program which was created by the Education Amendments of 1972 and reflects the decision which was made to emphasize providing aid, in the first instance, directly to students. Although, as already mentioned, the money provided for student aid as veterans' benefits and under the aegis of Social Security is not administered by the Office of Education it is, nevertheless, regarded as student-based aid. We have already indicated how much the federal government has recently been spending on aid. That point comes through in Table 49, but in the current context the even more important point that also comes through is how much of the total spending for financial aid is being distributed directly to students.

TABLE 49*

Spending of the Federal Government for Financial Aid, Fiscal Year 1977

Category	Amount (millions of dollars)
Institution-based Aid	1,036
Student-based Aid	6,848
TOTAL	7,884

*The Congress of the United States, Congressional Budget Office, Postsecondary Education: The Current Federal Role and Alternative Approaches, pp. 1-2.

The federal government is not alone in supporting student aid. The states also have programs of substantial consequence although in the aggregate they are not nearly as large as the federal programs. In 1969-70 roughly $200 million was awarded by states to 471,000 students. By 1975-76, the level of support had grown to roughly $500 million, and there were 860,000 recipients.[44] During 1977-78, states plan to spend about $746 million on awards to over 1.1 million students, a growth of 50 percent in just the past two years.[45]

The growth in state expenditures has been stimulated by the State Student Incentive Grant (SSIG) program of the federal government which offers matching funds for the states. Enacted as part of the Education Amendments of 1972, the program was not put into operation until 1974-75. In 1969, only nineteen states had programs of financial aid for students. As of 1974-75, thirty-nine states had sixty-one programs that qualified for funds under SSIG, and by the fall of 1977, Alaska was the only state not offering some need-based aid for its students.[46] There have been numerous limitations on the distribution of the states' funds. Of the sixty-one separate programs in 1974-75, fifty-one were restricted to undergraduates, forty-eight were limited to full-time students, and in forty-seven the use of the funds was limited to in-state institutions.[47]

Two characteristics of the states' programs were noteworthy. First, the expenditures are heavily concentrated in a few states. In the aggregate, roughly two-thirds of the spending is done by five states -- New York, California, Illinois, Pennsylvania, and Ohio. New York's contribution is expected to be about 30 percent of all spending by the states for financial aid in 1977-78. Because the programs of other states have expanded, this concentration is less pronounced than it was a few years ago -- those five leading states spent roughly three-quarters of the total in 1971-72 -- but it is still quite substantial.[48]

The second characteristic is the difference in orientation between state and federal grant programs. Federal programs give much of their money to students from families with relatively low incomes who tend to go to public institutions. By contrast, more than half of the aid distributed by the states goes to students who attend private institutions.[49] Joseph Boyd, executive director of the Illinois State Scholarship Commission, has commented:

> It is clear that large numbers of students who are not being served by the federal programs, with family incomes between \$12,000 and \$30,000 are receiving large amounts of state assistance.[50]

A major question for the future is the extent to which the federal government may condition matching funds upon particular terms which the states dislike. It is possible that there will be disagreement upon whether recipients may be part-time as well as full-time students as well as over which institutions are eligible recipients of the funds. Probably the most sensitive issue for the states is "portability." If the federal government were to insist that matching funds would be available only if students from a given state could use the aid at institutions in other states, there would probably be intense controversy.

Federal and state programs of financial aid together generate revenues which have recently amounted to nearly \$9 billion annually. In comparison with total current-fund revenue currently somewhat over \$40 billion, this amount is substantial though, of course, one must not overstate the comparison since not all of the money designated for student aid actually becomes revenue for the institutions. A central theme of federal policy in recent years has been to put financial aid into the hands of the students and allow them to spend it largely as they choose. This development has put many institutions in the position of having to sell their services and compete for students in a more explicit sense than ever before. One important limitation on consumer sovereignty has been the tendency of the states not to allow the financial aid they disburse to be spent outside their borders.

6. The Federal Government as a Direct Purchaser of Services from Institutions of Higher Education

So far the discussion of the financial interaction between the federal government and higher education has been about the government's role as the third part in a third-party-payment mechanism. There is another important dimension to the relation, the dimension in which the government allocates money to higher education for purposes other than financial aid for students. It is not obvious how best to characterize this other kind of spending. It certainly serves to support institutions, but it is not general institutional support. Typically it involves the purchase of some service which the government wants and which the educational institution is well-suited to provide.

Largely, though not exclusively, this spending has been for academic science. In fiscal year 1975, the major agencies purchasing services from universities and colleges had obligations amounting to $4.5 billion, and $2.8 billion of that total -- 62 percent of it -- was for academic science.[51] Two factors provided the impetus for this large amount of spending on academic science. The first was the American reaction, so frequently described, to having been outdone by the Soviet Union's successful launching of Sputnik in 1957. The second has been the government's willingness to support, at very high levels of funding, research in medicine and biomedical science.

There are several points to make about federal spending on the services of higher education in general and spending for the support of science in particular. First, although for the entire spectrum of institutions receipts for science were approximately 62 percent of all direct receipts from the federal government in fiscal year 1975, that percentage was even higher for those few institutions which received most of the money. For the top 10, 30, and 100 institutions, those percentages were, respectively 80, 82.3, and 77.5.[52]

Second, both total federal spending and spending for academic science are highly concentrated in those institutions which rank near the top on the basis of funds received. Table 50 shows the relationships. Concentration is high for both series but higher

TABLE 50*

Approximate Percentage of Federal Funds and Federal Funds for Science Received by Top Ranking Institutions, Rank Based on All Funds Received, Fiscal Year 1975

Category of Institutions	Approximate Percentage of All Funds Received by	Approximate Percentage of All Funds for Academic Science Received by
Top 10	15.7	20.5
Top 20	27.3	36.7
Top 30	35.6	47.4
Top 50	47.6	61.7
Top 100	65.3	82.0

*National Science Foundation, A Report to the President and and Congress. Federal Support to Universities, Colleges..., pp. 9-10.

for funds for academic science. To approach this concept in a slightly different way, the National Science Foundation lists 2,502 universities and colleges which received some money in fiscal 1975 from the major federal agencies spending money in this way. Of those 2,502 institutions, only 1,036 receive any money at all in support of academic science, and 387 of those received less than $25,000 each.[53]

A third important point is that, for a small number of institutions, an unusually large proportion of current-fund revenue comes from the federal government. Table 51 shows the magnitudes involved. Howard University is obviously unusual in the relative degree of support from the federal government. This support reflects its particular history; the federal government provides it with direct budgetary support analogously to the way that states do for state institutions. Except for MIT, each of these universities has a medical school, and obviously some important relationships would be clearer still if the finances of each medical school were disentangled from the finances of the rest of the university. Unfortunately the data necessary to allow that separation are not readily available. Even in the absence of that refinement, the general point is quite clear: each of these institutions is heavily dependent on money from the federal government. When there is unpleasant news from Washington regarding the availability of federal funds for academic science, it can make many academics in places like Cambridge, Madison, and Berkeley very uncomfortable.

TABLE 51*

Total Obligations from Selected Federal Agencies as a Percent of Current-Fund Revenue for the Top 10 Universities Ranked on Total Obligations From Selected Federal Agencies, Fiscal Year 1975

(1) Institution	(2) Current-Fund Revenue	(3) Total Obligations from Selected Federal Agencies	(4) (2) as Percent of (3)
	(millions of dollars)		
University of Washington	$209	$81	39
Massachusetts Institute of Technology	247	80	32
Howard University	88	75	85
University of California at Los Angeles	334	75	22
University of Minnesota	370	74	20
Stanford University	290	70	24
Columbia University	210	66	31
Harvard University	253	65	26
University of California at San Diego	166	63	38
University of Wisconsin at Madison	276	63	23

*The data in column 2 were gathered from officials of the various universities. The data in column 3 came from: National Science Foundation, A Report to the President and Congress. Federal Support to Universities, Colleges..., p. 9.

A very few institutions refuse, on principle, to accept funds from the government. Wabash College is one of them. Benezet quotes the following statement of Wabash's position:

> Although founded by Presbyterian ministers and laymen, Wabash from its beginning has been independent of church affiliation. It affirmed the same principle of self-sufficiency when state and federal funds were offered to private colleges. The Trustees resolved "to solve the financial problems which confront us, however great they may be, through voluntary gifts." Wabash therefore remains one of the few colleges and universities in the country that neither seek nor accept federal funds.[54]

Wabash's philosophy is highly unusual, and no doubt it can lead to certain hardships of its own. However, one problem an institution which subscribes to this philosophy need not face is how to respond to a decline in support from the federal government. Many other institutions have had to cope with that issue because, after a long period of unusually large growth, the course of federal spending changed dramatically. Between 1955 and 1968 federal outlays to colleges and universities for research and development -- a category which is closely related to but not as inclusive as academic science -- grew, in constant dollars, at an average annual rate of 17 percent. In 1968 that trend changed dramatically, and between 1968 and 1975 those outlays, in constant dollars, declined at an average annual rate of one percent.[55]

Coming, as it did, in the late 1960s, this turnabout was one more factor contributing to the tendency for higher education's costs to grow faster than revenues. As a matter of fact, rapid growth of tuition in the major private research universities started around 1968 and has continued into the 1970s. It appears that these institutions, fortunate in having strong demand, relied rather heavily upon this asset to counteract the faltering revenue.

7. Income from Endowment

A final source of revenue which deserves attention is income from endowment, chiefly in the private sector. Although there are substantial variations among institutions, the private sector in total obtains a small amount and a relatively small proportion of its revenue from the earnings of endowment. To some extent, this result reflects the fact that the return on a broad spectrum of financial investments has not been too robust in recent years -- to put it mildly. In earlier periods income from endowment provided a somewhat larger proportion of current-fund revenue for all private institutions, 13 percent in 1919-20 and 12 percent even in 1929-30. However, the relatively minor contribution of income from endowment these days is not primarily attributable to the performance of the capital markets. There are only a few private institutions with endowments of any genuine consequence. Harvard's endowment of over $1 billion is well known; what is less well known is that, as of 1975, only roughly ninety private institutions had endowments worth over $5 million.[56] Thus, although endowment provides a comfortable augmentation to other forms of income for a relatively few institutions -- most of which happen to be well known -- for most the endowment fund is small and an unimportant source of current income.

E. Summary

At the end of this long discussion of the financing of higher education two quotations seem especially pertinent. First, in surveying the changes that had come about between the time of his initial and his follow-up study, Cheit made this important observation:

> A return check on the campuses whose financial conditions were reported in The New Depression in Higher Education reveals that, whatever the validity of the charge that neither exhortation, rebellion, or a new outside world can make colleges and universities change, it is now clear that a shortage of money can.[57]

This way of stating the matter goes together very nicely with Howard Bowen's characteriziation of and comments upon educational finance:

> ...the biggest factor determining cost per student is the income of the institutions. The basic principle of college finance is very simple. Institutions raise as much money as they can get and spend it all. Cost per student is therefore determined primarily by the amount of money that can be raised. If more money is raised, costs will go up; if less is raised, costs will go down. Standards of operation as to number and quality of personnel, teaching loads, physical plant, and the like are set at whatever level falls within available income under the given market conditions. From the point of view of those who supply the funds, however, the question is: what are reasonable standards, taking into account alternative uses of scarce resources involved? What funds are genuinely needed to maintain an adequate educational system for America of the late twentieth century?[58]

In an important sense there is little to add to Bowen's comments. There is no such thing as the unequivocally "right" level of support. Expenditures and income do tend to go hand-in-hand. Problems arise when the rate of growth of income tends to be less than the rate of growth of expenditure because, in general, imbalance cannot last for long. Budgets will have to be cut, and, as Cheit has observed, in the life of academic institutions a shortage of money really does make a difference. That difference is all the greater because a very large proportion of educational institutions' costs are relatively fixed for relatively long periods of time.

VI. CONCLUDING OBSERVATIONS

The preceding discussion has made clear that competition among institutions for students will be one of the basic themes of the economics of higher education in the coming decades. At one level this competition will be between the public and the private sectors, but it will also exist within each sector. Enrollment and educational finance are intimately related, and, as we have seen, institutions with much excess capacity will be in danger of having unsustainably large deficits. This problem will be especially threatening to those institutions which rely heavily on tuition. These institutions tend to be smaller, and for a small institution even what might seem, at first glance, like a minor unfavorable swing in enrollment can have disastrous consequences.

A corollary of the competition for students is that in an atmosphere in which revenue is hard to obtain, there will be continuing efforts to economize along the lines of what has already been happening in the 1970s. Hans Jenny, speaking in 1974, expressed the dilemma these efforts create simply and well. He said:

> After discounting the effects of inflation, we are now spending less per student than we did four years ago. How long can we go on spending less and less and charging the student more and more?[1]

Jenny's question is well put, and it highlights the difficulty of the large number of private colleges for which price competition with the public sector is a reality.

Although the competition for students is a central theme of the times and is destined to become even more intense, there are also some noteworthy examples of cooperation, especially between elements in the public and private sectors. Some awareness has emerged that there are opportunities to pair excess capacity in the private sector with pressures to expand capacity in the public sector. An especially dramatic example happened when, in January, 1976, the City University of New York, hampered by the city's fiscal troubles, sent letters to 7,000 prospective students suggesting that, rather than enrolling at CUNY, they consider the Brooklyn campus of Long Island University.[2]

A particularly important aspect of the interrelation between the financial health of the sector and the quality of its efforts relates to the intellectual vigor of the faculty. Since World War II, virtually continuous growth of enrollments has made possible the regular addition of new young members to the professional ranks. This infusion of new talent and new ideas is typically regarded as a major source of continuing vitality. Now, however, the total annual demand for new faculty members promises to be exceedingly small for a long time to come, and Allan Cartter has referred to a process of "tenuring-in."[3] Although there are indications that it probably won't happen, there is the possibility that this already difficult situation will become even worse because of an increase in the average age at which professors retire. Viewing the dilemma in March of 1977, Dr. Richard C. Atkinson said: "In some disciplines, it is not an exaggeration to fear that we may lose an entire generation of bright, young minds."[4]

Long as this paper is, one which covered every facet of the economics of higher education would be longer still. Brief mention of a few of the more important topics that have not been covered follows.

One is the role of unions and collective bargaining. Unions are obviously playing an ever-increasing role in higher education, and they are bound to be a force tending to increase the ratio of fixed to variable costs, a ratio which, for higher education, is already exceedingly high. In this context two broad types of unions are relevant: first, faculty unions and second, unions representing the non-academic employees of colleges and universities.

A separate though related topic is the tenure system. In the context of academic values, that system is highly prized as a guardian of academic freedom. In the context of institutional finance, however, it is one more force -- like unions -- tending to raise the ratio of fixed to variable costs. If the age distribution of the faculty were fairly stable and the system were expanding, the problems associated with the tenure system would not be severe, but in the decade to come, as the average age of the faculty increases, debates related to tenure will probably become intense.

Still a third topic which has not been covered is the measurement of need in the context of financial aid. The major programs of aid are need-based. This designation means that they incorporate some judgment about how much any particular student and his or her family can be expected to contribute towards the cost of a particular education. Although systems exist to make these computations in a perfectly straightforward way, these systems are based upon some rather critical assumptions about how the families of students who apply for aid should be spending their income. What has been called the problem of pricing the middle class out of the market for private education is a direct outgrowth of those assumptions and also of the amount of money that is available, in the aggregate, for financial aid. This whole range of issues is intimately connected to two fundamental questions: who attends college? Which colleges thrive?

There are two other matters of importance which relate to financial aid and which have not received attention in this paper. The first is the process of determining under what circumstances a young person is to be regarded as financially independent for the purpose of computing need. Obviously that issue has enormous financial implications. The second is the subject, rather well publicized by now, of default on federally insured loans. The problem has risen to such substantial proportions that the government has now decided to use an outside agency to aid in the process of collection.[5] In its own way, each of these two problems is of great significance, and much depends on how they are resolved.

So much for issues that have been omitted. As we anticipate the future, perhaps the overriding theme is an imbalance between the providers and the purchasers of the services of colleges and universities. Exactly how that imbalance will be resolved in the coming years is unknown. Will the public subsidy of demand through financial aid be so large that the size of the sector will remain essentially unaltered and possibly even grow? Or will demand be sufficiently limited so that adjustment comes largely through a reduction in the number of institutions and the size of the faculty in the aggregate?

When the issue is phrased in that way, we can come, at the end, to the question which may be, simultaneously, the most important and the most elusive. To what extent will higher education's financial difficulties impair the sector's ability to accomplish its principal functions of learning and teaching? There is no simple answer, but if that question is kept in mind, it may help one truly to comprehend events pertaining to American higher education as they unfold in the years to come.

NOTES

II. SOME HISTORICAL THEMES

1. David Riesman provides a very illuminating discussion of some aspects of the diversity within America's system of higher education. See David Riesman, Constraint and Variety in American Education (place of publication unlisted: University of Nebraska Press, 1956).

2. David Madsen, The National University: Enduring Dream of the U.S.A. (Detroit: Wayne State University Press, 1966), pp. 15-16.

3. Ibid., p. 17.

4. Ibid.

5. Martin Trow, "Diversity: Key Resource for an Uncertain Future," Princeton Alumni Weekly, September 12, 1977, p. 7.

6. Madsen, The National University..., pp. 28-29.

7. Quoted in Ibid., pp. 31-32.

8. George Washington, The Last Will and Testament of George Washington and Schedule of His Property, 4th edition, edited by Dr. John C. Fitzpatrick (place of publication unlisted: The Mount Vernon Ladies' Association of the Union, 1972), p. 9.

9. Madsen, The National University..., p. 33.

10. Donald G. Tewksbury, The Founding of American Colleges and Universities Before the Civil War with Particular Reference to the Religious Influences Bearing upon the College Movement (New York: Teachers College, Columbia University, 1932), pp. 32-33.

11. Richard Hofstadter and C. DeWitt Hardy, The Development and Scope of Higher Education in the United States (New York and London: Columbia University Press, 1952), p. 4.

12. Ibid., p. 3. The quotation is from New England's First Fruits.

13. R. Freeman Butts and Lawrence A. Cremin, A History of Education in American Culture (New York: Holt, Rinehart, and Winston, 1953), p. 81.

14. Quoted in Tewksbury, The Founding of American Colleges..., p. 60.

15. Quoted in Ibid.

16. Tewksbury, The Founding of American Colleges..., p. 142.

17. An excellent account of American higher education during the Revolution is Jurgen Herbst, "The American Revolution and the American University," Perspectives in American History, Vol. X (1976), pp. 279-354.

18. Daniel Webster's eloquent statement is quoted in: Frederick Rudolph, The American College and University: A History (New York: Alfred A. Knopf, 1965), pp. 209-10.

19. Ibid., pp. 210-12.

20. It need hardly be emphasized that a good case could be made for a variety of dates as the time when a particular college was founded. The dates given in Table 1 correspond to when a charter authorizing the granting of degrees was issued. Other definitions of the founding could be when the first student enrolled or when the first degree was actually awarded. Often, different colleges can become "first" as the criterion for the founding changes.

21. Hofstadter and Hardy, The Development and Scope..., pp. 6-7.

22. Elbert Vaughan Wills, The Growth of American Higher Education: Liberal, Professional and Technical (Philadelphia: Dorance and Company, 1936), pp. 72-73.

23. George N. Rainsford, Congress and Higher Education in the Nineteenth Century (Knoxville, Tennessee: The University of Tennessee Press, 1972), p. 74.

24. Quoted in Rudolph, The American College and University: A History, p. 229.

25. Rainsford, Congress and Higher Education..., p. 75.

26. Ibid.

27. Quoted in Ibid., p. 230.

28. Ibid., pp. 231-33.

29. Butts and Cremin, A History of Education in American Culture, p. 286.

30. Hofstadter and Hardy, The Development and Scope..., p. 96.

31. Butts and Cremin, A History of Education in American Culture, p. 286.

32. Hofstadter and Hardy, The Development and Scope..., p. 95.

33. Wills, The Growth of American Higher Education..., p. 123.

34. Butts and Cremin, A History of Education in American Culture, pp. 451-52.

35. Quoted in Rudolph, The American College and University..., p. 252.

36. Ibid., p. 253.

37. Rainsford, Congress and Higher Education in the Nineteenth Century, p. 97.

38. Quoted in Rudolph, The American College and University..., p. 256.

39. Ibid., pp. 260-61.

40. Ibid., p. 265.

41. Ibid., p. 334.

42. Ibid., p. 335.

43. Ibid., pp. 269-275, 332, 335. Butts and Cremin, A History of Education in American Culture, p. 423.

44. Rudolph, The American College and University..., p. 271.

45. Ibid., pp. 276-78.

46. Quoted in Ibid., pp. 278-79.

47. Wills, The Growth of American Higher Education..., pp. 148-51.

48. Quoted in Rudolph, The American College and University..., p. 352.

49. A survey of Catholic higher education in America through the latter part of the 1960s is provided in: Andrew M. Greeley, From Backwater to Mainstream: A Profile of Catholic Higher Education (New York and other cities: McGraw-Hill Book Co., 1969).

III. THE INSTITUTIONS: RECENT BACKGROUND AND CONTEMPORARY SETTING

1. Arthur Pedolsky and Carolyn R. Smith, Education Directory: Colleges and Universities, 1976-77 (Washington: U.S. Government Printing Office, 1977), p. XXVIII. This figure is based on the assumption that a branch campus is a separate institution. For the fall of 1975 the total number of institutions, including branch campuses, was 3,026. If those branch campuses were not regarded as separate institutions, the total for the fall of 1975 was 2,765. See W. Vance Grant and C. George Lind, Digest of Education Statistics, 1976 Edition (Washington: U.S. Government Printing Office, 1977), p. 79. Throughout this paper the latest readily available data are used which means that some of the trends are not carried through quite to 1976-77 because of the difficulty of obtaining such recent data on some subjects.

2. The full spectrum of American postsecondary education extends well beyond the institutions in the collegiate sector. For a discussion of this matter, see The National Commission on the Financing of Postsecondary Education, Financing Postsecondary Education in the United States (Washington: U.S. Government Printing Office, 1973), pp. 13-20. The Commission has provided a fourfold taxonomy for all of postsecondary education: first, the collegiate sector; second, the noncollegiate sector; third, other postsecondary institutions; and fourth, other learning opportunities. The first category consists of the institutions which we are studying, and the fourth category consists of "learning opportunities offered by such organizations as churches, libraries, museums, art galleries, labor unions, public radio and television, civic organizations, industrial organizations, professional associations, and chambers of commerce throughout the nation."

   The National Commission's second and third categories consist of institutions devoted, in the former case, to vocational education and, in the latter case, to education for both vocational and recreational ends. The major distinction is that institutions in the second category -- the noncollegiate sector -- were eligible to participate in some major federal programs of financial aid for students whereas institutions in the third category were not eligible to participate in any of these programs. Around 1972-73 there were estimated to be 3,500 institutions in category three and 7,016 institutions in category two. The latter -- those in the noncollegiate sector -- 87 percent of which were private, enrolled about 1.6 million students; they included, for example, 1,481 schools of cosmetology and 1,345 flight schools.

3. For a brief history of this scheme of classification, see The Carnegie Commission on Higher Education, A Classification of Institutions of Higher Education (Berkeley, California: The Carnegie Foundation for the Advancement of Teaching, 1973), pp. v-vi.

4. Data on enrollment are typically presented either on a so-called headcount basis or on a full-time equivalent -- abbreviated FTE -- basis. The FTE enrollment is derived by correcting the headcount enrollment appropriately for the fact that some students are not pursuing an academic program full-time. Unless there is any indication to the contrary, data on enrollment are presented in this paper on a headcount basis.

5. Louis T. Benezet, Private Higher Education and Public Funding (Washington: The American Association for Higher Education, 1976), p. 42.

6. In 1975 the Carnegie Foundation for the Advancement of Teaching did make available, for categories 1-4, the full-time equivalent enrollment in 1973, but for the first two categories the information is only provided at the one-digit level. See The Carnegie Foundation for the Advancement of Teaching, More Than Survival: Prospects for Higher Education in a Period of Uncertainty (San Francisco and other cities: Jossey-Bass Publishers, 1975), p. 51.

7. The U.S. Office of Education and the National Center for Education Statistics have provided information on institutions by highest level of offering in the following categories: "2 but less than 4 years beyond the 12th grade," "Bachelor's and/or 1st professional degree," "Master's and beyond but less than the doctorate," "Doctor of Philosophy and equivalent," and "Other." See, for example, Charles Andersen (editor), A Fact Book on Higher Education: Third Issue/1976 (place of publication unlisted: American Council on Education, 1976), p. 76.142.

8. Harold L. Hodgkinson, Institutions in Transition: A Profile of Change in Higher Education (Incorporating the 1970 Statistical Report), (New York and other cities: McGraw-Hill Book Company, 1971), p. 41.

9. Ibid., pp. 48-49.

10. Charles Andersen (editor), A Fact Book on Higher Education: Third Issue/1976, p. 76.141.

IV. ENROLLMENT: BACKGROUND AND OUTLOOK

1. Grant and Lind, Digest..., pp. 85-86. Enrollment in 1951 was 14% less than it had been in 1949. The decline was thus substantial.

2. Jack Magarrell, "The Freshmen Who Weren't Really There," The Chronicle of Higher Education, September 6, 1977, p. 15.

3. Grant and Lind, Digest..., p. 85.

4. It is likely that in earlier years this category was substantially underreported and that, therefore, improved reporting more recently has served to inflate the recorded growth rates. See Allan M. Cartter, Ph.D.'s and the Academic Labor Market (New York and other cities: McGraw-Hill Book Co., 1976), p. 54.

5. National Science Foundation, A Report to the President and Congress. Federal Support to Universities, Colleges, and Selected Non-Profit Institutions, Fiscal Year 1975. Detailed Statistical Tables. Appendix B. (Washington: National Science Foundation, date of publication unlisted), p. 13.

6. With additional qualifications too unimportant to warrant explanation here, the first-professional degree is regarded as the first degree in dentistry, medicine, optometry, osteopathy, podiatry, veterinary medicine, law, and theology. Grant and Lind, Digest..., p. 123.

7. The information by Carnegie classification is contained in The Carnegie Foundation for the Advancement of Teaching, More Than Survival..., p. 51. The information in Table 14 was estimated by the Carnegie Council. This information is based on a figure for full-time equivalent enrollment in 1973 of 7.1 million students. In making its calculations, the Council omitted enrollment in one-digit category 5 -- Professional Schools and Other Specialized Institutions. In 1970 enrollment in this category amounted to 286,800 which is 3.6% of 8,500,000, the figure which the Carnegie Commission used for total enrollment in that year. The data from the National Center for Education Statistics come from Grant and Lind, Digest..., p. 87. The data of the Carnegie Council and the NCES are not precisely comparable, but there is reason to believe that a rough correspondence exists between the Carnegie Council's category of Doctoral-Granting Institutions and the NCES' category of Universities, as well as between both groups' category of two-year institutions. There is also reason to expect substantial overlap between Carnegie categories 2, 3.1, and 3.2 and NCES' category Other 4-Year Institutions.

8. As usual, the numbers must be viewed with caution. Roughly 10 percent of the students are unclassified. Probably few of these are candidates for first-professional degrees, but it is not clear what to expect regarding the distribution between graduate and undergraduate programs. Moreover, it is useful to remember that the concept of enrollment as a graduate student can mean so many different things for Ph.D. candidates in the dissertation-writing state of their programs of study.

9. Charles Andersen (editor), A Fact Book on Higher Education: Second Issue/1976, p. 76.100.

10. Ibid.

11. Because the data on graduate enrollments are not readily separable into candidates for master's degrees and candidates for doctorates, results are presented only for the bachelor's and first-professional degrees. Moreover, since two-year colleges do not award degrees, their enrollment is excluded from the relevant denominators.

12. The Carnegie Foundation for the Advancement of Teaching, More Than Survival..., and Carol Hernstadt Shulman, Enrollment Trends in Higher Education (Washington: The American Association for Higher Education, 1976) are two books which cover this general subject very well.

13. Howard R. Bowen, "Higher Education: A Growth Industry?" Educational Record, Vol. 55, No. 3 (Summer 1974), p. 157.

14. Stephen P. Dresch, "Educational Saturation: A Demographic-Economic Model," AAUP Bulletin, Vol. 61, No. 3 (October 1975), p. 244.

15. As always, we must pause to consider problems with the data. The major point worth noting here is that Alaska and Hawaii were first included in 1959 and 1960, respectively. In their aggregate impact, these additions are not of great importance.

16. U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 704, "Projections of the Population of the United States: 1977 to 2050," (Washington: U.S. Government Printing Office, 1977), p. 6.

17. Allan M. Cartter, Ph.D.'s and the Academic Labor Market, p. 27.

18. Ibid.

19. See June Kronholz, "Baby Boomlet?" The Wall Street Journal, July 29, 1977, pp. 1 and 20; and U.S. Public Health Service, National Center for Health Statistics, Monthly Vital Statistics Report, Vol. 26, No. 5 (August 10, 1977).

20. Maximum here means, of course, local maximum.

21. The numbers are the Census Bureau's Series II projection, the middle projection of three. The three series differ in their assumptions about fertility. The assumption in Series II is a completed cohort fertility -- the average number of births per woman during her lifetime -- of 2.1.

22. The underlying demographic trends clearly point to hard times ahead for higher education. An interesting sidelight is that two specific developments have reduced the amount of advance warning the sector has had. The first is the time-horizon of the Department of Health, Education, and Welfare's major annual publication of projections regarding American education. The projections are formally for ten years. In fact, at the time of publication, the last year for which a projection is made has been closer to eight than to ten years away. With virtually no loss of accuracy, certain information of critical importance to higher education could have been presented approximately a decade earlier than it actually was.

    The second development involves the outlook for births. It was not unreasonable to expect that the annual number of births would increase when the large number of women born during the "baby boom" after World War II entered their prime childbearing years. When this expectation failed to materialize, much was made of the possibility that the women were simply postponing having children. That may still ultimately turn out to be the case, but the trend through 1976 was all in the other direction. Thus, in recent years revisions of previous forecasts of the future size of the 18-24-year-old population have been consistently downward.

    Table A illustrates this point by focusing simultaneously on forecasts of the size of the 18-24-year-old population made in and for particular years. The Census Bureau typically publishes several forecasts each employing a different assumption about fertility. The numbers presented in Table A are from Series B for the forecasts made in 1967 and 1968 and from Series II for the forecasts made in 1975 and 1977. Series B assumes a completed cohort fertility of 3.1, substantially above the figure of 2.1 upon which Series II is based.

    What Table A makes quite clear is that a major change came between 1968 and 1975 in the estimate for 1990; it was reduced by roughly five million. And even between 1975 and 1977, the projection of the number of 18-24-year-olds in 2000 was reduced by roughly 6 percent.

    The alteration in the outlook for the size of the college-age population had its impact upon forecasts for enrollment towards the end of the century. For example, in 1971 the Carnegie Commission on Higher Education anticipated a growth in aggregate enrollment of roughly one-third during the decade of the 1990s.

(See The Carnegie Commission on Higher Education, New Students and New Places: Policies for the Future Growth and Development of American Higher Education (New York and other cities: McGraw-Hill Book Co., 1971), p. 1.) Just four years later, The Carnegie Foundation for the Advancement of Teaching which for these purposes can surely be viewed as a close corporate relative of the Carnegie Commission, was anticipating growth in aggregate enrollment during the 1990s of less than 10 percent. (See The Carnegie Foundation for the Advancement of Teaching, More Than Survival..., p. 45.)

TABLE A*

Estimates and Projections of the Size of the 18-24-Year-Old Population Made in Various Years and For Various Years

(in thousands)

Year Projection or Estimate Made in	Year Projection or Estimate Made For					
	1975	1980	1985	1990	1995	2000
1967	27,535	29,612	28,759	30,122		
1968	27,535	29,612	28,759	30,122		
1975	27,597	29,441	27,834	25,162	23,641	26,328
1977		29,462	27,853	25,148	23,222	24,653

*U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 381, "Projections of the Population of the United States, by Age, Sex, and Color to 1990, with Extensions of Population by Age and Sex to 2015," (Washington: U.S. Government Printing Office, 1967), p. 80.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 388, "Summary of Demographic Projections," (Washington: U.S. Government Printing Office, 1968), p. 40.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 601, "Projections of the Population of the United States: 1975 to 2050," (Washington: U.S. Government Printing Office, 1975), p. 9.

U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 704, pp. 40, 45, 50, 55, 60.

23. Allan Cartter was especially careful about matters like this one. See Cartter, Ph.D.'s and the Academic Labor Market, pp. 32-40.

24. Charles Andersen (editor), A Fact Book on Higher Education: Second Issue/1976, p. 76.128.

25. Cartter, Ph.D.'s..., p. 45.

26. Ibid., pp. 44-46 and 54-57.

27. Dresch, "Educational Saturation: A Demographic-Economic Model," AAUP Bulletin. Dresch's argument is elaborate and carefully developed, but its central feature has been presented here.

28. Richard B. Freeman, The Declining Economic Value of Higher Education and the American Social System (United States of America: Aspen Institute for Humanistic Studies, 1976).

29. Ibid., p. 8.

30. Ibid.

31. Bowen, "Higher Education: A Growth Industry?" Educational Record, p. 153.

32. Richard Freeman has presented interesting material on the dynamics which connect the demand for highly educated labor and the demand for education. See, for example, Richard B. Freeman, The Market for College-Trained Manpower: A Study in the Economics of Career Choice (Cambridge, Massachusetts: Harvard University Press, 1971).

33. Cartter, Ph.D.'s..., pp. 126-27, 224-29.

34. Charles Andersen (editor), A Fact Book on Higher Education: Fourth Issue/ 1976 (place of publication unlisted: American Council on Education, 1976), p. 76.291. Simon and Frankel, Projections of Educational Statistics to 1983-84, p. 48. Grant and Lind, Digest..., p. 122.

35. Cartter, Ph.D.'s..., p. 227.

36. See David W. Breneman, Graduate School Adjustments to the "New Depression" in Higher Education (Washington: National Board on Graduate Education, 1975), pp. 1-9.

37. Lewis B. Mayhew, Graduate and Professional Education, 1980: A Survey of Institutional Plans (New York and other cities: McGraw-Hill Book Co., 1970), p. 1. Mayhew's figure for the number of doctorates awarded in 1968-69 differs slightly from the one given recently by the National Research Council. See Table 28.

38. Cartter, Ph.D.'s..., p. 238.

39. Legislation governing the age of retirement is currently under consideration. Should legislation pass entitling faculty members to remain fully active until, say, the age of 70, the magnitude of the indicated reduction in candidates enrolling for the Ph.D. will presumably be even greater.

40. This paragraph relies heavily on Edward B. Fiske, "Job Outlook Good, Students Jam Accounting Courses...," The New York Times, August 9, 1977, p. 27.

41. As has already been indicated, Freeman deals with this general subject in detail. He also has developed a specific model of the market for accountants. See Freeman, The Market for College-Trained Manpower, especially chapters 2, 4, and 8.

42. Association of American Medical Colleges, Medical School Admission Requirements 1978-79: United States and Canada (28th Edition, Washington: Association of American Medical Colleges, 1977), p. 107.

43. Ibid., p. 77ff.

44. Association of American Medical Colleges, Medical Education: Institutions, Characteristics and Programs (Washington: Association of American Medical Colleges, 1977), p. 23.

45. Charles Andersen (editor), A Fact Book on Higher Education: Fourth Issue/1976, p. 76.282.

46. The Carnegie Foundation for the Advancement of Teaching, More Than Survival..., pp. 50-81.

47. See Humphrey Doermann, Crosscurrents in College Admissions (Revised edition; place of publication unlisted: Teachers College Press, 1970) and Humphrey Doermann, "The Future Market for College Education," in A Role for Marketing in College Admissions (New York: College Entrance Examination Board, 1976).

48. Doermann has developed comparable information for 1964, 1970, 1972, 1978, and 1984; it is presented in his paper, "The Future Market for College Education."

49. Doermann's figure for the number of high school graduates differs slightly from the figure of 3,137,000 used in the calculation for Table 25.

V. FINANCE

1. The National Commission on the Financing of Postsecondary Education, Financing Postsecondary Education in the United States, p. 194.

2. The Carnegie Foundation for the Advancement of Teaching, More Than Survival..., p. 4.

3. "Universities: Anxiety Behind the Facade," Time, June 23, 1967, p. 82.

4. Ibid., p. 78.

5. William Bowen has a good discussion of this issue. See William G. Bowen, The Economics of the Major Private Universities (place of publication unlisted: The Carnegie Commission on Higher Education, 1968), pp. 12-16.

6. Ibid., p. 19.

7. The original study is: Earl F. Cheit, The New Depression in Higher Education: A Study of Financial Conditions at 41 Colleges and Universities (New York and other cities: McGraw-Hill Book Co., 1971). The follow-up is: Earl F. Cheit, The New Depression in Higher Education - Two Years Later (Berkeley, California: The Carnegie Foundation for the Advancement of Teaching, 1973).

8. Cheit, The New Depression in Higher Education: A Study..., pp. 52, 74, and 96. Cheit, The New Depression...Two Years Later, p. 52.

9. Cheit, The New Depression...Two Years Later, p. 52.

10. Cheit, The New Depression...Two Years Later, pp. 52-53. The study by June O'Neill to which Cheit refers is the following: June O'Neill, Resource Use in Higher Education: Trends in Output and Inputs, 1930 to 1967 (Berkeley, California: The Carnegie Foundation for the Advancement of Teaching, 1971).

11. The Carnegie Commission on Higher Education, The More Effective Use of Resources: An Imperative for Higher Education (New York and other cities: McGraw-Hill Book Co., 1972), pp. 35-36.

12. Cheit, The New Depression...Two Years Later, p. 53.

13. Ibid.

14. Lyle H. Lanier and Charles J. Andersen, A Study of the Financial Condition of Colleges and Universities : 1972-1975,(Washington: American Council on Education, 1975).

15. D. Kent Halstead has developed a price index for higher education which was used to transform current to constant dollars.

16. Lanier and Andersen, A Study of the Financial Condition..., p. 16.

17. Cheit, The New Depression...Two Years Later, p. 51.

18. Ibid.

19. "The Coming Shakeout in Higher Education," Forbes, September 15, 1974, p. 45.

20. What was not mentioned in the article in Forbes is that the increase in enrollment came as a consequence of Bowdoin's decision to become coeducational. This information was provided on the telephone by an official of the college.

21. Simon and Frankel, Projections of Educational Statistics to 1983-84, p. 64.

22. The data are imperfect. Some enrollments are not on an FTE basis, and the measurements for faculty include administrative and other professional staff.

23. Cheit, The New Depression...Two Years Later, p. 71.

24. Lanier and Andersen, A Study of the Financial Condition..., p. 75.

25. The forecast derived from Cartter's work is the average of two of the forecasts he made. See Cartter, Ph.D.'s..., p. 183. The essential assumptions incorporated in the forecast derived from Cartter's work are that the student-faculty ratio will increase during the 1970s and then decline during the 1980s toward 15:1 and that during the 1980s there will be a net annual decline in the faculty of 1.5 percent in response to a relative decline in academic salaries.

26. W. John Minter and Howard Bowen, Private Higher Education: Third Annual Report on Financial and Educational Trends in the Private Sector of American Higher Education (Washington: Association of American Colleges, 1977). This volume is a part of Minter and Bowen's continuing study of financial conditions in the private sector which they have been pursuing for several years by following a sample of 100 institutions. Their work is sponsored by the American Association of Colleges, and so far three reports have been published.

27. Chester E. Finn, Jr., "Federal Patronage of Universities in the United States: A Rose by Many Other Names?" Minerva, Vol. XIV, No. 4 (Winter 1976-77), p. 500. In fiscal year 1976, the federal government's payments to institutions and for student aid amounted to $12.6 billion. The division is $4.4 billion for the institutions and $8.2 billion for student aid. This result can be made more compatible with the figure of $5.9 billion presented in Table 45 as the amount of aggregate current-fund revenue coming from the federal government in 1974-75. It turns out that a portion of the money which Finn calls assistance to students would actually be designated in the current-fund revenue account as income from the federal government under the altered method of accounting adopted with the publication of the data for 1974-75. When the appropriate adjustments are made the result provides some confidence in the underlying logic which links the numbers and the definitions.

28. The distinction between "tuition" and "tuition and fees" is not typically great, and hereafter reference to tuition is intended to designate the more general concept as well as the narrower one, each in the appropriate context.

29. Any comparison between the size of the percentages in Tables 45 and 46 should be made with some caution because a different base is used in each case: educational and general revenue in Table 46 and current-fund revenue in Table 45.

30. The general issue of pricing in higher education is thoroughly covered in: Carl Kaysen, "Some General Observations on the Pricing of Higher Education," in Seymour E. Harris, ed., Higher Education in the United States: The Economic Problems, Supplement to The Review of Economics and Statistics, Vol. XLII, No. 3. Part 2 (Cambridge, Massachusetts: Harvard University Press, 1960), pp. 55-60.

31. Benezet, Private Higher Education and Public Funding, pp. 7-8.

32. "Shifting State Aid from College to Student: A New Plan for Higher Education," Carnegie Quarterly, Vol. XXV, No. 3 (Summer 1977), p. 4.

33. The Staff of the Carnegie Commission on Higher Education, Tuition: A Supplemental Statement to the Report of the Carnegie Commission on Higher Education on 'Who Pays? Who Benefits? Who Should Pay?' (Berkeley, California: The Carnegie Foundation for the Advancement of Teaching, 1974), p. 2.

34. Howard Bowen, "Financing Higher Education: The Current State of the Debate," Higher Education, Human Resources, and the National Economy, Addresses and Discussion Papers from the Sixtieth Annual Meeting of the Association of American Colleges (Washington: Association of American Colleges, 1974), p. 29.

35. Research and Policy Committee of the Committee for Economic Development, The Management and Financing of Colleges (New York: Committee for Economic Development, 1973), pp. 68-69.

36. The Carnegie Commission on Higher Education, Higher Education: Who Pays? Who Benefits? Who Should Pay? (New York and other cities: McGraw-Hill Book Co., 1973), pp. 107-10.

37. The Staff of the Carnegie Commission on Higher Education, Tuition..., p. 4.

38. American Association of State Colleges and Universities, Low Tuition Fact Book: 8 Basic Facts about Tuition and Educational Opportunity (Washington: American Association of State Colleges and Universities, 1976).

39. Howard Bowen, "Financing Higher Education: The Current State of the Debate," Higher Education, Human Resources, and the National Economy, p. 39.

40. Chester E. Finn, Jr., "Federal Patronage of Universities in the United States: A Rose by Many Other Names?" Minerva, pp. 499-500.

41. Jonathan D. Fife, Applying the Goals of Student Financial Aid (Washington: The American Association for Higher Education, 1975), p. 19. Anne C. Roark, "Federal Student Aid and How It Grew," The Chronicle of Higher Education, October 11, 1977, p. 5. The Congress of the United States, Congressional Budget Office, Postsecondary Education: The Current Federal Role and Alternative Approaches (Washington: U.S. Government Printing Office, 1977), p. 2. All of these sources, as well as Chester Finn's paper cited in the previous note, serve to indicate the very large amount that the federal government has been spending on financial aid in recent years.

42. Finn, "Federal Patronage...," Minerva, p. 500.

43. Roark, "Federal Student Aid and How It Grew," p. 5.

44. Fife, Applying the Goals of Student Financial Aid, p. 17.

45. Anne C. Roark, "States Plan to Spend $746 Million on Aid to Students," The Chronicle of Higher Education, October 31, 1977, p. 9.

46. Ibid., plus a conversation with an official from The Chronicle of Higher Education.

47. Fife, Applying the Goals of Student Financial Aid, p. 18.

48. Anne C. Roark, "States Plan to Spend...," p. 5.

49. Ibid.

50. Ibid.

51. National Science Foundation, A Report to the President and Congress. Federal Support to Universities, Colleges..., p. 9.

52. Ibid., pp. 9-10.

53. Ibid., pp. 48-76.

54. Benezet, Private Higher Education and Public Funding, p. 19. Benezet cites Wabash College, "For Continued Independence and Excellence - The Case for Wabash College and the Liberal Arts Tradition in an Era of Challenge and Opportunity," (Crawfordsville, Indiana: Wabash College, 1974), p. 2.

55. National Science Foundation, National Patterns of R & D Resources: Funds & Manpower in the United States, 1953-1977 (Washington: U.S. Government Printing Office, 1977), pp. 22-23 and 30-31.

56. The numbers on endowment were provided by the National Center for Education Statistics.

57. Cheit, The New Depression...Two Years Later, p. 15.

58. Howard R. Bowen, "Financial Needs of the Campus," The Corporation and the Campus, ed. Robert H. Connery (New York and other cities: Praeger Publishers, 1970), p. 81.

VI. CONCLUDING OBSERVATIONS

1. Quoted in "The Coming Shakeout in Higher Education," Forbes, September 15, 1974, p. 40.

2. Benezet, Private Higher Education and Public Funding, p. 26.

3. Cartter, Ph.D.'s..., p. 174.

4. Dr. Richard C. Atkinson, "University Research and Graduate Education," (National Science Foundation, March, 1977), mimeographed.

5. "Collection Agency to Help U.S. Find Loan Defaulters," The Chronicle of Higher Education, September 12, 1977, p. 11.

APPENDIX: SOME SUGGESTIONS FOR ADDITIONAL READING

As it is with many areas of knowledge, the literature on the economics of higher education has become voluminous. Should a reader of this paper wish to consult additional sources, the following suggestions may prove helpful.

A fine history of American higher education is provided by:

Rudolph, Frederick. The American College and University: A History. New York: Alfred A. Knopf, 1965.

David Riesman offers great insight into important aspects of the diversity within America's system of higher education in:

Riesman, David. Constraint and Variety in American Education. Place of publication unlisted. University of Nebraska Press, 1956.

Each year since 1972 the American Association for Higher Education has published ten reports on different topics. They are generally referred to as the ERIC/Higher Education Research Reports. These documents tend to be highly informative and well done. Three of special interest are:

Benezet, Louis T. Private Higher Education and Public Funding. Washington: The American Association for Higher Education, 1976.

Fife, Jonathan D. Applying the Goals of Student Financial Aid. Washington: The American Association for Higher Education, 1975.

Jenny, Hans H. Higher Education and the Economy. Washington: The American Association for Higher Education, 1976.

Regarding the outlook for enrollment a source which many people who study these matters have found useful is:

The Carnegie Foundation for the Advancement of Teaching. More Than Survival: Prospects for Higher Education in a Period of Uncertainty. San Francisco and other cities: Jossey-Bass, 1975.

An extremely creative approach to thinking about enrollment in the future comes from Humphrey Doermann:

Doermann, Humphrey. "The Future Market for College Education," in A Role for Marketing in College Admissions. New York: College Entrance Examination Board, 1976, pp. 1-53.

For anyone who has a special interest in the market for Ph.D.s, Allan Cartter's book is an excellent example of careful work on this subject:

Cartter, Allan M. Ph.D.'s and the Academic Labor Market. New York and other cities: McGraw-Hill, 1976.

Richard Freeman provides some more general connections between the market for highly trained labor and the demand for higher education:

Freeman, Richard B. The Declining Economic Value of Higher Education and the American Social System. United States of America: Aspen Institute for Humanistic Studies, 1976.

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